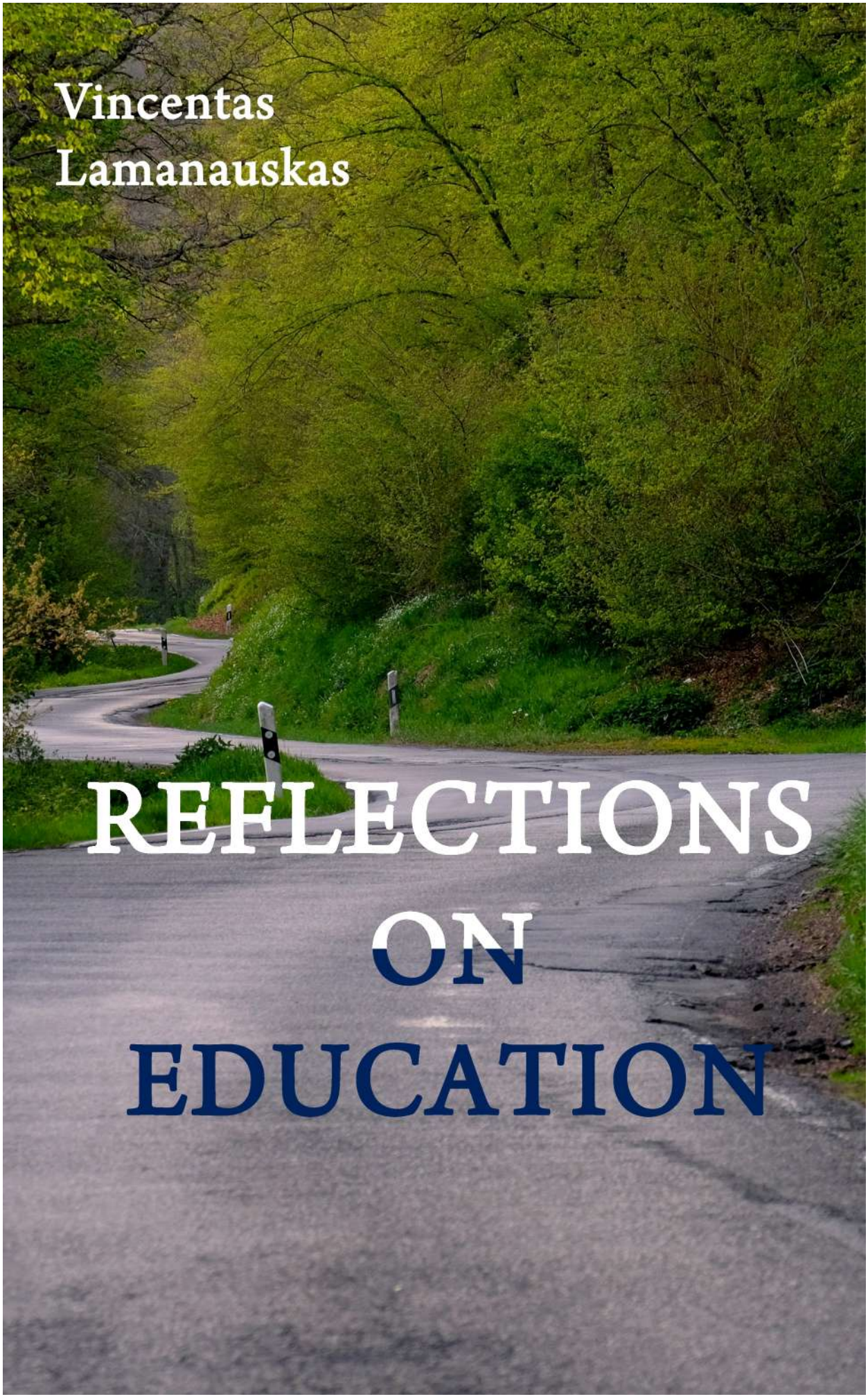
Vincentas
Lamanauskas
REFLECTIONS
ON
EDUCATION

Vincentas Lamanauskas

REFLECTIONS ON EDUCATION

Vincentas Lamanauskas

REFLECTIONS ON EDUCATION

ŠIAULIAI 2017

The bibliographic information about the publication is available in the National Bibliographic Data Bank (NBDB) of the Martynas Mažvydas National Library of Lithuania

Lamanauskas, V. (2017). *Reflections on education*. Šiauliai: Scientia Socialis Press.
ISBN 978-609-95513-3-3

ISBN 978-609-95513-3-3
© Scientia Socialis, Ltd., 2017

CONTENTS

PREFACE / 9

INTRODUCTION / 15

GENERAL EDUCATION / 19

EFFECTIVE ICT IMPLEMENTATION AS A PRECONDITION FOR DEVELOPING GENERAL AND VOCATIONAL EDUCATION / **21**

PEDAGOGICAL PRACTICE AS A KEY TO REAL PEDAGOGUE'S SUCCESS SOLUTION / **26**

THE IMPORTANCE OF PSYCHOLOGICAL TEACHERS' PREPARATION FOR EDUCATIONAL ACTIVITY / **29**

REFERENCES / **33**

EDUCATION POLICY / 35

EDUCATION DIVERSITY AS AN INDICATOR OF SOCIETY POSITIVE DEVELOPMENT / **37**

FROM TEACHING TO LEARNING: A NEW PARADIGM IN MODERN EDUCATION / **40**

EDUCATION FORTUNES AND FAILURES: BETWEEN TENDENCIES AND CONTINGENCIES / **43**

DISAGREEMENTS AND PARADOXES OF EDUCATION / **47**

THE DOCTRINE OF DEGRADED EDUCATION: BETWEEN MYTHS AND REALITY / **53**

SOME FEATURES ABOUT THE ISSUE OF FALSIFIED EDUCATION / **58**

THE ”McDONALD‘S-IZATION“ OF EDUCATION: SEARCH FOR FAST RESULTS / **61**

PEACE PEDAGOGY OR/AND EDUCATION FOR PEACE: SOME ACTUALITIES / **66**

TEACHER-EDUCATOR VERSUS TEACHER-LEADER / **69**

REFERENCES / **72**

EDUCATION MANAGEMENT / 75

FROM QUALITY MANAGEMENT TO MANAGING QUALITY: SYSTEMIC APPROACH / **77**

PERSPECTIVE MANAGEMENT: SYSTEMIC THINKING AND VALUE SYNERGY NECESSITY / **82**

THE QUALITY OF STUDIES: MANAGEMENT ASPECT / **85**

RESPONSIBILITY FOR MANAGEMENT / **89**

SOME FEATURES OF EDUCATION MONITORING / **92**

UNIVERSITY MANAGEMENT: A FEW PROBLEMATIC THINGS / **95**

REFERENCES / **99**

EDUCATION QUALITY / 101

HIGH-QUALITY EDUCATION AS KEY FACTOR FOR SUCCESS IN A KNOWLEDGE-BASED SOCIETY / **103**

QUALITY OF HIGHER EDUCATION: IDEALS AND REALITY / **106**

EDUCATIONAL POLICY IN TERMS OF THE CONCEPT OF MODERN LIBERAL EDUCATION / **110**

QUALITY OF EDUCATION: FASHION OR NECESSITY?! / **115**

SOME SKETCHES ON QUALITY / **120**

SOME EDUCATION QUALITY MANAGEMENT SKETCHES / **123**

REFERENCES / **127**

ICT IN EDUCATION / 129

DIGITAL EDUCATION: SOME IMPLICATIONS / **131**

SOCIAL NETWORKING WEBSITES: NEW EDUCATIONAL SPACE / **134**

INFORMATION & COMMUNICATION TECHNOLOGY PENETRATION INTO EDUCATION: SOME THOUGHTS / **137**

REFERENCES / **139**

SCIENCE & TECHNOLOGY EDUCATION / 141

SCIENCE EDUCATION AS A CORE COMPONENT OF EDUCATEDNESS / **143**

SOME IDEAS ABOUT SCIENCE AND TECHNOLOGICAL EDUCATION ACTUALITIES AND PERSPECTIVES / **145**

SOME IDEAS ABOUT SPECIFICITY AND METHODS OF FOSTERING VALUE-BASED RELATIONS WITH NATURE / **151**

THE IMPORTANCE OF STRENGTHENING OF NATURAL SCIENCE EDUCATION IN A PRIMARY SCHOOL / **155**

INTEGRATED SCIENCE TEACHING BY APPLYING DIDACTIC DIFFERENTIATION: SOME ACTUAL CIRCUMSTANCES / **160**

THE COMMON GOAL OF ALL EDUCATORS: HOW TO IMPROVE SCIENCE AND TECHNOLOGY EDUCATION / **169**

LEARNERS' INTERACTION WITH NATURE: SOME EDUCATIONAL ISSUES / **173**

THE COOPERATION OF SCIENCE TEACHERS: SOME RELEVANT ISSUES / **179**

THE PECULARITIES OF THE EXTRACURRICULAR ACTIVITIES OF PRIMARY NATURAL SCIENCE EDUCATION / **183**

INTEGRATED SCIENCE EDUCATION IN THE CONTEXT OF THE CONSTRUCTIVISM THEORY: SOME IMPORTANT ISSUES / **188**

ECOLOGIZATION OF THE WORLD OUTLOOK AS THE KEY PURPOSE OF EDUCATIONAL PRACTICE / **192**

TRADITIONAL AND CONSTRUCTIVE NATURAL SCIENCE EDUCATION PARALLELS / **196**

TEN THESES ON MODERN NATURAL SCIENCE EDUCATION / **200**

HUMANISATION OF NATURAL SCIENCE EDUCATION AS A PROBLEM / **206**

DEVELOPMENT OF SCIENTIFIC RESEARCH ACTIVITY AS THE BASIC COMPONENT OF SCIENCE EDUCATION / **209**

A PROBLEM OF SCIENCE LITERACY ENCOUNTERED BY PRIMARY SCHOOL TEACHERS AND LEARNERS / **212**

NATURAL SCIENCE EDUCATION IMPORTANCE IN ADOLESCENCE / **215**

SCIENCE AND MATH TEACHERS' COLLABORATION: HOW TO DEVELOP IT SEEKING PUPIL'S SUCCESS AT SCHOOL / **218**

NATURAL SCIENCE AND TECHNOLOGY EDUCATION: "RESETTING" MEANING / **221**

NATURAL SCIENCE AND TECHNOLOGY EDUCATION: VALUES COMPONENT / **225**

REFERENCES / 228

AFTERWORD / 241

PREFACE

IN some cases, a book composed of a series of articles might appear not well structured, rhapsodic and not completely convincing to its internal logic. Some brilliant ideas might be expounded, but a common red line connoting the whole book might be difficult to be found. This is not the case with Vincentas Lamanauskas' book: this text is composed of some of the articles written by the author in the last ten years, but the structure of the book is powerful, clear and well argued, so that the papers appear as true chapters of a book written *ex novo*. They are well connected and show Lamanauskas' general conception of education – and specifically – science education – role within society.

A very philosophy of education is expressed in this book, which I try to summarize in some items, though I am perfectly aware that it is impossible to offer, in a Preface, all the nuances explained by the author in his text:

- The resort to new technologies, in particular, to software as PowerPoint, Paint or Excel, or to various means available on the Internet to teach sciences as biology, chemistry and physics presents several advantages in an educational perspective: they allow the teacher to spare time, they permit useful simulations and make visual and interactive explanations possible, which is difficult with the classical book-based instruction. Nonetheless, they also have disadvantages because they risk to completely replace the direct chemical and physical experiences, which are fundamental for a pupil to grasp the way in which chemistry and physics are developed. As to biology and natural sciences, a massive resort to ICT risks to separate the pupils from a direct contact with the nature and the living beings, as animals and trees, rather inducing them to think that the whole reality is a virtual reality and not a natural one. Furthermore, on several occasions,

the teachers are not ready to propose a positive ICT based-education. Finally, the excessive use of computers implies postural and visual problems as well as possible addiction to the instrument (as it is the case with some games). Therefore, Lamanauskas claims, each country and each context need a specific examination on the most appropriate manner to introduce technological means within modern education. With regard to Lithuania and, in general, to the ex-Soviet nations, the author, also offers precious specific indications (see "Effective ICT implementation as a precondition for developing general and vocational education"; "Education fortune and failures: between tendency and contingencies"; the whole section "ICT in education"; "Some ideas about science and technological education actualities and perspectives"; "Some ideas about specificity and methods of fostering value-based relations with nature").

- Partially in connection with the previous item, there is a problem of the *fast-training* that is the idea that education might be offered in a quick manner, with some sort of miraculous recipes, which makes the learning easy, pleasant and possible to obtain almost without pain and study. This is the phenomenon called by Lamanauskas "The McDonald's-ization of education". This problem is already present in the schools, but it becomes particularly apparent for the universities, which often, compete not to offer a good instruction, but only an attractive one. This means an easy *curriculum studiorum* and, inevitably, a superficial instruction. The author clearly identifies the situation with the fact that universities compete for money and not for the quality of the instruction. The McDonald's-ization of education has a cause (see item 3)) and a consequence (see item 4)).
- The cause is that, relying upon the example of several Western countries, the institutes of educations (schools, colleges and universities) are treated as a sort of industry: they have to produce money, or at least, they have to minimize the expenses. The aim of the educational institutions is transforming from that to offer a solid education to that of being an immediate economical source. Education as a business: this is what Lamanauskas sees as a terrible danger for the future generations. As the author claims at p. 51: "The market imposes the rules of the game", while this should not be the case in an educative context. The same conception is clearly and well explained in almost all the chapters of the section: "Education Management", where Lamanauskas clarifies that "The most important is to survive in market. Thus, in this respect study quality becomes a subject of minor importance"

(p. 88). If the cause of the McDonald's-ization of education is the fact that instruction is treated as a business, what is its consequence?

- Lamanauskas has no doubts: the consequence is twofold: a) progressively the young generations are losing their interest in natural science because to study biology, chemistry or physics is difficult. In contrast, they are progressively attracted towards sociology and management. Albeit these faculties offer a preparation far inferior to that offered by the Natural Sciences faculties, the students are attracted because of their ease. Lamanauskas remarks this has been evident in Lithuania, where, at the beginning of the 21th century the Natural Science faculties increased the number of students, but, from ten years they are living an evident crisis; b) the faculties themselves of sociology and management offer a continuously decreasing level of instruction to attract the students. This is extremely negative for Lithuania and, in general, for all the countries of the ex - Soviet-Union, because the presence of serious and well prepared manager would be important (see the whole section "Education management").
- In connection with this situation, there is also a general problem connected to moral. The education is not only instruction on a specific subject, it has also to offer a general moral point of view to the pupils and, afterwards, to the students. The basis of this moral should be the respect for work and study and, with this, for other persons. However, if a pupil gets the habit to avoid a serious study and to reason only in terms of business, the moral value of the school-university gets completely lost and subverted. I totally agree with what Lamanauskas writes: "universities must concentrate on public spiritual and moral education. … An educated person is first of all sensitive and obliged to other people" (p. 66). Then: how is it possible to restore the interest in science education, taking into account that the relations between teachers-professors and pupils-students as well as the teaching methods have to change with respect to the past? In the long and conclusive section of his book ("Science and Technology Education"), the a. tries to offer some clever and applicable ideas to improve the teaching and the learning of natural sciences.

To conclude, I would like to claim that Lamanauskas' book is a very useful text to reflect also on the situation of instruction in the Western countries, not only on the countries of the Central-East Europe. I mean: the author, in several passages of his book, points out that the way in which the Soviet-Union government controlled the instruction was, for many aspects, not adequate. Nonetheless,

the instruction has to be followed and directed by the governments, it cannot be left merely to itself or to the private initiative, otherwise, the McDonald's-ization will follow. This means that a third view has to be thought of and followed. It is difficult, but Lamanauskas tries to offer some ingredients for this third view in this interesting and perfectly self-consistent book.

Dr. Paolo Bussotti
Udine, Italy
21 May 2017

INTRODUCTION

Dedication
To my children Eglė and Vaidas

WE probably wouldn't be wrong asserting, that education is the object of constant discussions. This is both a complicated, and complex, and controversial phenomenon. By this book it is not sought to analyse deep, strategic education topics, only to draw attention to certain problematic questions and /or to express personal position referring to Lithuanian and personal experience and context. The content of the book is divided into six conditional topical chapters, in which education problems are highlighted. This is not an easy task. The articles are written in the period of 2007-2016. Education, as any other field, is changing very rapidly, regardless of certain conservativeness of this system. On the other hand, there exist and have to exist certain foundational and fundamental things, providing the stability of the system, guaranteeing its effective functioning. Education cannot escape fashion influence. A lot of things at a certain period become just fashionable, and a certain part of society (including pedagogical and scientific societies) in essence are blindly following such very often not grounded fashions and tendencies. Thus, how to keep system stability, a suitable direction in such a turbulent environment. The author hopes that certain thoughts and ideas expressed in the published articles at least in a small part fulfil this goal. This is not easy, because very often one has "to swim against the stream", there is a risk to remain a minority, to be criticized or even not understood and so on.

The mentioned articles are written during the mentioned period seeking to react to various education and science problems. I have always thought, that public discussion is the best way to solve problems rationally and sensibly. The worst thing is indifference. Then "*the strongest*" can do anything in respect of "*the weakest*". In various discussions or private conversations very often one can hear, that a lot of things in Lithuanian (and not only in Lithuanian) education and science world are not quite good, however one avoids to speak in public about the problems. I don't think, that nothing can be changed, that one cannot influence the processes running in society. Isn't it, that each of us are "*the bricks*" of this society? We have to start from small things if we want to change something. Therefore, I think that one's opinion expres-

sion on relevant education and science development questions, is very important. This is not only personal opinion expression, it also helps the others form their position. On the other hand, one can also understand those, who do not want to get involved in quite often not fruitful discussions, especially when the other opinion is not accepted, not heard. Eventually, this causes a state of indifference, because a person feels helpless. I still hope, that we have dare to speak about all difficulties and problems. In the same way we have to speak about achievements, about what is positive. There is lack of this quite often, too. I hope, that in this book the reader will also find a lot of positive things. Writing each of these articles, I was trying to reflect on those time realia, to express my personal attitude or evaluation. Maybe, some articles of this book will seem polemic, or just critical, however, this can be justified by an elementary axiom, stating, that in education it is more important to define problems than to find their solutions. There aren't any ready recipes or sensible advice here. I hope, that the readers, appealing to their mind and thought, will find the answers themselves to the questions, which concern them and are actual for them.

This collection of articles does not pretend in any way to become a fundamental publication. The author's aim is not that. I hope, that the book will be just interesting for those, who are not indifferent to education. I also think, that the readers, appealing to their mind and thought, will find the answers themselves to the questions, which concern them and are actual for them.

I am thankful for my like-minded colleague Dr. Paolo Bussoti, who kindly agreed to write a preface for that book, and for all others, who in one way or another contributed to making this book.

GENERAL EDUCATION

EFFECTIVE ICT IMPLEMENTATION AS A PRECONDITION FOR DEVELOPING GENERAL AND VOCATIONAL EDUCATION

'No success can be achieved without thoughtful planning and thorough preparation'
Kazuo Inamori

IN the 21st century, the questions discussing background quality became crucial issues having a reflection in the international documents (the Barcelona Declaration, 2002, Lisbon Strategy Implementation Programme, EUROSCENE 2003 etc.) which draw up the guidelines for future education and decisive actions. The documents focus on the relevance of developing teaching methodology and technologies. Shortage of close attention prevents from the process of creating a competent public knowledgeable society (Strategy for Education for Sustainable Development, 2005) that is constructive and highly capable of building democracy in continuously changeable present and future life. Daily growing signs and impact of globalization show that individual steps require greater coordination in the international context. Formally, all the above mentioned subjects are highly relevant to us and closely relate to the dimensions of the Education for Democratic Citizenship in Europe (Education for Democratic Citizenship, 2001-2004).

Modern ICT definitely play a crucial role in developing the teaching/learning processes at all stages and improving the quality of education. Actively involved information/knowledge-based society offers new opportunities to effectively satisfy students' needs for teaching/learning. In addition to this, no new teaching/learning environments can be created without ICT. Technological progress and rapid development inevitably touches education sector. The breakthrough in education can be clearly noticed in the majority of European countries.

Educational advantages of ICT raise no doubts. The use of ICT substantially helps with introducing educational material in a more modern and vivid way. Applying ICT in the teaching/learning process does not object to the basic didactical principles such as visualization, systemization, links between theory and practice, knowledge consolidation, encouragement of student participation in different activities, individualization and differentiation of teaching etc. Recently, Lithuanian teachers have been deeply involved in the *Microsoft PowerPoint* program which is very useful for preparing lessons as well as for other educational activities. The teachers suppose that such

lessons are much more purposeful, interesting and increases motivation for learning. It can be clearly stated that when using the above introduced program, the teachers of different subjects have already made suggestions on different topics which open wide possibilities of integrating various themes, presenting information contained in a few chapters, increasing visualization of teaching etc. The teachers notice that shortage of time is one of the major drawbacks. In order to put forward qualitative suggestions, enough time and appropriate computer literacy skills are required. Gained experience and prepared teaching/learning material are the subjects worth being emphasized. Legal requirements of copyright certainly must be satisfied. A series of recent expert surveys in Lithuania disclosed that some teachers including Lithuanian Association of Physics Teachers (LFMA, 2008) and Lithuanian Association of Geography Teachers (LGMA, 2008) found useful a possibility of using special databases where necessary didactic material should be accumulated (Lamanauskas, Vilkonis, 2006). However, at the moment, Lithuanian Associations of Chemistry and Biology Teachers are not very actively involved whereas Lithuanian Association of Informatics Teachers (LInMA, 2008) is working very effectively. The website of the latter association is particularly useful as it presents different information that embraces conference texts, methodical information, discussion notes, reviews etc.

Apart from the above mentioned program that focuses on making presentations, Lithuanian teachers widely and effectively use such general purpose software as *Microsoft Word*, *Microsoft Excel* etc. It is worth noticing that *Microsoft Excel* has a number of qualities, and therefore everyone learning to use a computer can find this software helpful. *Microsoft Paint* is rather frequently applied in educational practice due to its quality to produce computer graphics. Another virtue of ICT which is saving teacher's time must be emphasized. Using a computer is convenient as it helps with presenting and organizing different sorts of data whereas the Internet greatly assists in finding necessary information. Collaboration between teachers and students' parents is an important process of schooling. E-mail helps teachers with contacting learners' parents as well as the learners themselves. Lately, e-calendars are being widely implemented in Lithuanian schools which offer learners' parents possibilities of becoming acquainted with schoolchildren's achievements. The process of applying the Intranet in such educational institutions as comprehensive and vocational schools is slowly progressing. However, even in this case, a rapid development is taking place. The implementation of the Intranet occurs with increasing rapidity. The Intranet presents report forms, annual and long-term educational curricula and other required documents and references which facilitate manipulating information.

Another apparent quality of applying ICT is inter-cultural collaboration. Lithuanian comprehensive and vocational schools are active in joining international projects and programmes. In case of rejecting ICT, such collaboration should be barely accepted. The employment of ICT can help with organizing audiovisual conferences and expanding other methods of collaboration. For example, a number of Lithuanian

comprehensive schools have been participating into the international project *ENO-Environment Online* (ENO-Environment Online, 2008).

School life is extensively attacked by virtual teaching and learning environments allowing easily and flexibly organize the processes of teaching and learning. The virtual teaching/learning environment *Moodle* (http://moodle.org/) is one of the most popular systems. Suchlike environment offers a lot of different teaching and learning activities. Moreover, teachers can introduce teaching/learning material using a simple text, references to different websites on the Internet or hypertexts created on individual basis. Other virtual learning environments including *Web CT*, *ATUTOR*, *First Class* etc. are also being used. It should be mentioned that the establishments of higher education were the institutions that first started implementing and using the above introduced environments. Nevertheless, at the moment, comprehensive and vocational schools are trying` not to lag behind their colleagues from universities. In recent years, in order to adapt vocational training for the needs of labour market and to encourage collaboration between employers and institutions of vocational education, the system of Lithuanian vocational education has been improved. The use of the European Union funds designated for vocational training helps with a rapid implementation of ICT.

However, ICT implementation covers more than creation and development of virtual learning environments. Practising only a virtual environment is not the most efficient way. For example, taking into account teaching natural sciences, it is worth reminding that sciences are based on experimentation. Therefore, the process of science education requires a practical-experimental approach in real teaching/learning environment. In this case, a burning question how to combine modern ICT and the above mentioned approach arises. One of the methods is implementing teaching/learning technologies of augmented reality. At the moment, five countries of the European Union are participating in the international project *ARiSE* based on the innovations in the field of ICT. (http://www.arise-project.org). A group of Lithuanian scientists from Science Education Research Centre of the University of Siauliai are involved in the project. The ARiSE project will develop the AR platform and associated pedagogical scenarios of use, enabling teachers to promote new teaching practices for teaching scientific and cultural content in primary and secondary schools. The ARiSE project is carried on in a consortium of seven partners: Fraunhofer IAIS (Germany) – coordinator, Siauliai University (Lithuania), AccrossLimited (Malta) /until 30/06/2007, replaced by University of Brighton (UK), ICI Bucureşti (Romania), Czech Technical University in Prague (Czech Republic), Siauliai City Juventa School (Lithuania) and Rabanus-Maurus Gymnasium Mainz (Germany). The first consumers' impression about the AR teaching/learning platform is positive. The product is evaluated as highly useful. The AR learning platform creates conditions for a better understanding, and therefore is acceptable for younger learners encountering difficulties with perceiving abstract, invisible processes. The AR learning platform increases students' motivation

for learning. The possibility of learning by doing, touching a real object with hands, monitoring and changing the place of the object has been positively evaluated. The learners' ability not only to monitor but also to control certain processes has been perfectly evaluated (Lamanauskas, Pribeanu, Vilkonis, Balog, Iordache, Klangauskas, 2007).

One of the most important requirements for applying ICT and innovative techniques of teaching is a qualified teacher able to professionally use technologies in practice. A modern teacher must know how to employ ICT and adapt them in order to achieve specific goals of teaching. If previous teachers were more focused on technical aspects of applying ICT, recently, educational aspects of employing ICT have gained more weight. Likewise in the majority of countries in Central and Eastern Europe, shortage of young teachers can be noticed in Lithuania. An effective use of modern ICT is difficult for aged teachers. Although they can increase their qualifications in teacher training institutions at different level, still, similar activities do not compensate substantial gaps in the field they are dealing with. An interesting point is that in the majority of cases, students' computer literacy remains higher than that of their teachers. Nevertheless, teachers' computer literacy becomes an essential professional work condition. The use of ICT in education offers many new possibilities but the necessary ones are only the latest knowledge and skills of teachers (Bilek, Zemanova, Turcani, 2007). It is likely that these fields of discussion will be paid closer attention.

Apart from effective implementation of ICT, it should be carefully considered possible negative outcomes of applying these technologies. For example, the premises equipped with a larger number of work stations must agree with certain hygiene standards established individually by every country. However, the standards themselves do not vary. A relevant fact is that in case of a larger number of computers in the classroom, a person might work in a strong electromagnetic field which negatively affects organism. A learner must sit in a comfortable work station that fulfils all possible hygiene requirements. The latter conditions are frequently ignored in schools due to various reasons. Electromagnetic radiation emitted by computers first of all, affect eyes, central nervous, reproduction and heart and vascular systems. It is extremely dangerous for younger learners. If a child spends too much time at a computer, one can start suffering from reduced eyesight sharpness. Though the rays sent out from computer do not cause any particular diseases, however, the human organism is definitely affected. Besides the above introduced valeologic and ergonomic problems, other disorders such as psychological dependence might occur. One of the Lithuanian websites discloses information that the findings of psychological research carried out by the scientists from the U.K. show concern that children under ten years old have nothing to do at computer! Even educational games might have a negative impact on younger children as in that case, maturity is decelerated, interest in child-focused games and communication with peers are decreased, attention is disturbed and imagination is

poorly developed (Child Addiction to Computer / Vaikų priklausomybė nuo kompiuterio, 2007).

A short review reveals that in one or another case, ICT may cause negative outcomes. First of all, it might be users' health problems. The researchers underline that widespread using ICT has caused necessity to rise up questions about protection of students` health and other categories being taught, for example ergonomical problems (Jarinovskis, 1997, Gedrovics, Lamanauskas, 2006). Thus, the question *of the negative impact of ICT* is gaining more weight. It seems no answers are required. On the other hand, we are still suffering from shortage of information on different aspects having negative impact. When the answer is clear, we start feeling lack of required abilities and knowledge of *how to reduce the negative impact of ICT* or how to eliminate or at least to minimize it. Another important issue is *what the real impact of modernization on society in terms of ICT implementation is*. We are expecting that the coming years will bring us together to solve the above discussed problems and find positive decisions.

2008
Problems of Education in the 21st Century, 5, 5-8.

PEDAGOGICAL PRACTICE AS A KEY TO REAL PEDAGOGUE'S SUCCESS SOLUTION

PEDAGOGICAL practice preparing future teachers is, undoubtedly, one of the most important elements of university studies. However, up to now pedagogical practice remains a very problematic sphere. Pedagogical activity, on the whole, is complicated, diverse and manifold. After all, it is an activity requiring creativity, high intellect and good psychological preparation. A student doing pedagogical practice, inevitably encounters various hardships -both specialty/professional and psychological. During the practice many different kinds of pedagogical situations are revealed. Various scientific research studies, carried out in the last few years, show the common situation – students-practitioners lack psychological preparation in communication with students, adjusting to a new environment, understanding them and so on. Actually, pedagogical practice theoretical and practical questions were discussed in the international scientific conference which took place between 1- 5 July, 2013 in Yerevan (Armenia). The conference under the theme „Modernization of Continuous Practice and Implementation of Organizational Mechanisms in the Higher Pedagogical Education System" was organised by Armenian State Pedagogical University named after Khachatur Abovyan.

Pedagogical practice organization questions, innovative practice approaches were discussed in the conference. Very often universities do not attach enough attention to this sphere, doing the practice in itself is rather formal. One of the essential questions is the type of practice. During the conference a position was expressed, that pedagogical practice has to be constant and continuous. In other words, it has to cover all the period of bachelor studies. From the very first course the student has to adequately be acquainted with the real school activity, with the real educational process and according to possibilities take part in it. This can be observation of educational process, analysis, discussion, experience accumulation and so on. It can be thought, that pedagogical practice is usually performed in senior courses. Its amount measuring in study credits is not big. Nowadays, the universities are looking for possibilities to involve students into pedagogical practice already from the first course. The other

important aspect is - the process of spread, development and maturity of student's acquired competencies takes place during pedagogical practice. Effective feedback should guarantee study process changes. In this respect, clearly fixed pedagogical practice content is a significant thing. Quite often this cannot be achieved, because students, doing pedagogical practice, get a lot of tasks according to studied university subjects. Not always their activity and responsibility limits are notified clearly during practices. Very often the dichotomy between educational (didactic) and psychological tasks can be observed. It is understandable, that carrying out various psychological tasks (e.g., related to students' personality cognition, their individual trait observation, interrelationship diagnostics and so on) students are not able to integrate their results into the educational process. In other words, pedagogical practice is a perfect period in the whole study process to relate the acquired pedagogical (didactic) and psychological knowledge into entire wholeness and be able to apply it practically. Pedagogical practice shows at the same time whether a young man wants and is capable to work at school. Capability is understood here as psychological preparation, susceptibility for development. On the other hand, university studies are quite often criticized because of too strong theorization. Students learn quite a lot; get acquainted with the newest educational, psychological theories. However, real application of acquired knowledge and abilities is quite another sphere. Pedagogical psychology can be thought to be that bridge which integrates pedagogical theory and practice.

One more significant thing is that during practices students usually refer to personal examples that they possess. First of all, student practitioner does not apply what he was taught and he learnt, but copies what he saw during his school and study years. In this respect, it is very important what sort of teachers' team takes part preparing future teacher.

Mentor's role in the pedagogical practice process was also a point of discussion during the conference. Pedagogical practice has to undoubtedly be carried out with the support of a mentor. Student practitioner not only does various educology, psychology, health education practical tasks or gives fragments of a subject lesson or conducts educational events. He has to learn observe, analyse, evaluate, reflect on the other pedagogues and students' conducted lessons and events and another performed professional activity. Mentor, here carries out the role of coordinator, advises and consults the practitioner. Mentor preparation for the pedagogical practice leadership becomes very urgent. Apart from the mentor, the school where students do the practice is of great importance too. Experience shows that quite often students do the practice in such institutions which often are not prepared for such an activity. Simply speaking, students should do the practice in the best schools where they could check themselves and take over the newest experience. This aspect also requires deeper thoughts.

Thus, the problematics of pedagogical practice remains topical. How to achieve, that it were an effective instrument not only helping the student to develop, but also to understand the essence of pedagogical activity, to realise your calling and possibilities

to do a very complicated and responsible pedagogue's job in future. Can we agree with the statement, that there has to be left as little theory as possible, and to transform all theory into practice? It is obvious, that pedagogical practice process, should considerably be improved, adapted to the time period. How to do this? The question remains open.

2013
Problems of Psychology in the 21st Century, 6, 4-5.

THE IMPORTANCE OF PSYCHOLOGICAL TEACHERS' PREPARATION FOR EDUCATIONAL ACTIVITY

IN recent years university study quality questions are discussed a lot. It is obvious, that the competition between universities getting stronger, it becomes the cornerstone subject of academic activity. Despite the fact, that universities are more or less autonomic, they experience strong competition both in a separate country context and internationally. On the other hand, labour market pressure and the requirements for prepared specialists are increasing. These are the most serious challenges for universities.

Without going deep into general study quality questions, there is a wish to draw attention to the fact, that one of the most important study quality components is psychological preparation of the future student. Urgent pedagogical practice organization and improvement questions were discussed in the international scientific conference, which took place on July 1-5, 2013, in Yerevan (Armenia) (http://www.armspu.am/upload/file/47(2).pdf). General outcome of the conference would be such - that organizing students' pedagogical practice in many countries exist various objective and subjective difficulties. Speaking about future teachers' preparation, pedagogical practice becomes a significant component of their university education. Pedagogical practice preparing future teachers is, undoubtedly, one of the most important elements of university studies. However, up to now pedagogical practice remains a very problematic sphere. Pedagogical activity, on the whole, is complicated, diverse and manifold. After all, it is an activity requiring creativity, high intellect and good psychological preparation. A student doing pedagogical practice, inevitably encounters various hardships -both specialty/professional and psychological. During the practice many different kinds of pedagogical situations are revealed. Various scientific research studies, carried out in the last few years, show the common situation – students-practitioners lack psychological preparation in communication with students, understanding them, adjusting to a new environment and so on (Lamanauskas, 2013).

However, pedagogical practice, how much important it might be, still does not guarantee that pedagogical future teacher's preparation is suitable and matches

nowadays requirements. One of the most essential problems is to find an appropriate, optimal balance between teachers' professional, pedagogical and psychological preparation. Opinions are quite different here. It is without doubt, that future teacher has to be qualified professionally, for example, to have knowledge in a concrete field - physics, chemistry or biology and so on. And this is understandable, because it depends on proper professional preparation, how the students are going to be taught in comprehensive schools. Those, who are supporting this direction, pay less attention to the other components of university education. One of the most frequent arguments is, that in comprehensive schools work psychologists who are very well prepared to carry out their job. In this respect, teacher specialist's psychological preparation seems to become a thing of a minor importance.

Why psychological teacher's preparation becomes very significant? First of all, it cannot be claimed that such preparation was not important earlier. However, declarative and realistic levels differed greatly. Today's teacher works in a different environment. Schools are more or less suitably provided with varied technological equipment. There is no doubt, that teacher's working tools are not only a textbook, a chalk and a board. Educational technology penetration is intensive. On the other hand, today we have different generation of young people. We are different; we have the most varied, very often opposed and incompatible demands. The teacher inevitably must know this and correspondingly act in the most unexpected situations. Psychological teachers' preparation, first of all, should be treated as a disposition to overcome present day challenges arising in his everyday educational activity. Especially, that the teacher is "plunged" into a special educational environment in which stress conditions and situations are very frequent. How to find a proper balance with such an environment? Challenges are the most varied. This is, of course, school fears, schoolchildren and teachers' interrelationship, communication and cooperation with schoolchildren's parents, society and so on. It is obvious, that teachers also need to understand the person, the spirit, of every child and find a way to nurture that spirit (Darling-Hammond, 2006).

Another psychological preparation component is psychological hardening, resistance and strength after collision with hardships arising in educational activity. All this has already to be acquired in the university study process and later constantly improved in work practice. The problem perhaps is this, that study process very often remains fragmental, psychology courses are poorly integrated with professional and especially pedagogical future teacher's preparation. Personal observations and discussions with the other country university colleagues allow claiming that such fragmentation is very distinct. As a rule, much less attention is devoted to psychology subject component in the study programs. Study modules are very much individualized, especially speaking about professional teacher's preparation. A little bit closer links are observed between psychological and pedagogical study modules. Very often psychology and psychological preparation tasks carried out by students are too much individualized, poorly related with future activity practice and they are formal. Even more

problematic is future teachers' ability of learning to identify psychological preparation problems. The teacher cannot be required to be able to solve various types of psychological situations, but he has to be able to adequately evaluate them and according to possibilities solve them. Working with various children, the teacher inevitably encounters with the most unexpected situations. The ability to discern them, to preventively solve them with the help of professional psychologists is very important. On the other hand, every teacher has to be able to give children even minimal psychological support.

Teacher's psychological stability is no less important. Teacher's work is marked by big emotional load. It is very important for the teacher to confide in his efforts, in himself, in his pupils and colleagues. Psychological stability definitely is the result of such confidence. From the point of view of the pupil, it is obvious, that every pupil is expecting teacher's support and understanding.

Thus, improving study process, it is necessary to evaluate how much study time and other resources are allotted for the psychological future teachers' preparation. Lithuanian university practice shows, that in the study process individual student work is overestimated, the workload of direct work with the students is being diminished. However, another extreme can easily be presented here. Lithuanian universities for many years already encounter with the pedagogical profile study programme students' motivation growing weaker. The research, carried out in Lithuania, in 2005 showed that the majority of future teachers do not have inner motivation to do pedagogical work (Paliukaitė, 2005). Another problem is directly related with this – undermined importance of psychological discipline studies. The student, lacking motivation to become a pedagogue, pays very little attention to this field studies as well. Very often the purpose of learning is to get a credit or to pass an exam. Evaluating more exhaustive, with this problematic related research studies one can claim, that many, having entered teacher preparing schools, are not in the mood to do that job from the beginning already, do not have pedagogical purposefulness, therefore, psychological, pedagogical disciplines do not make a big sense for them and their studies do not have direct motivation. Such situation is very apparent in present Lithuania, Latvia, in some other European countries. Of course, it is necessary to tell here, that in various countries the situation is different in fact, regardless of common things preparing future teachers. For example, in Japan one seventh receive a pedagogue's diploma of all wishing to receive it and only about one third of them are accepted to work (http://www.veidas.lt/viesa-paslaptis-kaip-isugdyti-gera-mokytoja. In Lithuania the situation has been observed for more than a decade, when not the very brightest school leavers choose pedagogy studies.

Classical psychology subject modules in the study programmes are important and this is undoubted, however, specialized, modules oriented more to practice are very necessary at present stage. Communication with children psychology should become a module integrating all psychological student preparation.

This is a serious challenge for the whole academic society. Guaranteeing proper psychological student preparation, much more attention and real time has to be devoted to self-analysis, reflexion and training, learning to analyze and assess concrete practical situations. Today's teacher is not only knowledge provider; he makes a direct influence on a young man's personality formation, talent and ability revelation, communication with people around. Therefore, it is very important that psychologically prepared teachers worked at schools. And here is one more quite often forgettable moment. Regardless of what psychologists specialists work at school, the teacher works alone in the classroom. Success of the lesson, in general, depends first of all, on how the teacher will be able to create a favourable psychological climate of the lesson. The question, whether psychological future teachers' preparation increases their ability to create a favourable psychological climate of the lesson or of any other occupation, remains open. Future teachers' psychological preparation aspects, discussed in brief, emphasize once again the importance of such preparation. More exhaustive scientific research studies, study process analysis and optimal recommendations for study process improvement are necessary.

2013
Psychological Thought, 6 (2), 169–172, doi:10.5964/psyct.v6i2.91.

REFERENCES

Barselonos deklaracija [Barcelona declaration] (1995 m. lapkričio 28 d.).

Bilek, M., Zemanova, M., Turcani, M. (2007). ICT for the workaday activity of chemistry teachers in the Czech Republic. In.: *Information and communication technology in natural science education – 2007* (Proceedings of International Scientific Practical Conference). Šiauliai: Publishing House of Šiauliai University, p. 29-32.

Darling-Hammond, L. (2006). Constructing 21st-century teacher education. *Journal of Teacher Education*, *57*, 300-314. doi:10.1177/0022487105285962.

Education for democratic citizenship, 2001-2004. Available via Internet at: www.coe.int/t/dg4/education/edc/Source/Pdf/Documents/2003_23_All-EuropStudyChildren-Participation_En.PDF -

European Science Education Network 2003 (2003). Retrieved from http://cordis.europa.eu/project/rcn/72889_en.html

ENO-Environment Online (2008). Retrieved from: http://www.joensuu.fi/eno/basics/briefly.htm (10-05-2008).

Gedrovics, J., Lamanauskas, V. (2006). Survey of ergonomics issues in computer classrooms of Latvian and Lithuanian schools. In.: Ernst, A. P., Koningsveld, Ruurd N. Pikaar, Paul J. M. Settels (Eds.), *Meeting diversity in Ergonomics* (IEA2006: 16th World Congress on Ergonomics, 10-14 July, The Netherlands). Maastricht, 6p, CD-ROM was produced for Elsevier by Galayaa B.V.

Inamori, K. (2006). *Gyvenimo filosofija* [Philosophy of life]. Vilnius, p. 50.

Jarinovskis, B. (2007). Questions of health protection of students at use of information-communication technologies. In.: *Information and Communication Technology in Natural Science Education – 2007* (Proceedings of International Scientific Practical Conference). Šiauliai: Publishing House of Šiauliai University, p. 71-75.

Lamanauskas V., Vilkonis R. (2006). *Internetas gamtamoksliniame ugdyme: situacijos analizė ir prognozės* [Internet in natural science education: Situation analysis and prognosis]. Šiauliai, p. 116.

Lamanauskas V., Pribeanu C., Vilkonis R., Balog A., Iordache D., Klangauskas A. (2007). Evaluating the educational value and usability of an augmented reality platform for school environments: Some preliminary results. Proceedings of 4th WSEAS/IASME International Conference on Engineering Education (Agios Nikolaos, Crete Island, Greece, 24-26 July, 2007). *Mathematics and Computers in Science and Engineering*, Published by World Scientific and Engineering Academy and Society Press, pp. 86-91.

Lamanauskas, V. (2013). Pedagogical practice as a key to real pedagogue`s success solution. *Problems of Psychology in the 21st Century*, *6*, 4-5.

Lietuvos fizikos mokytojų asociacija (2008). Prieigą per Internetą: http://www.lfma.ivi.lt/ (2008-05-10).

Lietuvos informatikos mokytojų asociacija (2008). Prieigą per Internetą: http://discovery.ot.lt/linma/right.htm (2008-05-10).

Lietuvos geografijos mokytojų asociacija (2008). Prieigą per Internetą: http://www.geografija.lt/index.asp (2008-05-10).

Nacionalinė Lisabonos strategijos įgyvendinimo programa (Lietuvos Respublikos Vyriausybės 2005 m. lapkričio 22 d. nutarimas Nr. 1270), [žiūrėta 2006-10-02]. Prieiga per internetą http://www.ukmin.lt/lt/strategija/doc/n.lis.pr.-2005-11-22,nr.1270.doc.

Paliukaitė, N. (2005). Būsimųjų mokytojų mokymosi motyvacija: psichologiniai parametrai [The motivation of future teachers learning: psychological parameters]. *Acta Paedagogica Vilnensia*, *14*, 58-66.

Vaikų priklausomybė nuo kompiuterio [Children's dependence on computer] (2007). Prieiga per Internetą: http://www.alfa.lt/straipsnis/136596 (2008-05-10).

EDUCATION POLICY

EDUCATION DIVERSITY AS AN INDICATOR OF SOCIETY POSITIVE DEVELOPMENT

IN the present age, education plays a crucial role. Globalization, challenges of the knowledgeable society and the breakthrough of technological development are the main factors stimulating the diversification of education systems in a number of countries. Society and education become more variable. On the other hand, education may have a significant impact on society i.e. to provoke and promote its alterations. Recently, a strong need for new competencies has shown up. Preparations for changes, modern information management, skills in general science management and strategic planning, the need for permanent learning etc. are accepted as extremely important competencies. New tasks are allocated for all types and levels of schools concentrating on comprehensive school the basic mission of which is to train a personality having a broad academic knowledge, capable of lifelong learning, able to find his/her own place in life and be an active member of the community. First of all, new education goals require rearranging the educational process and content.

After restoring the independence in 1990, different alterations have been taking place in the Lithuanian education system. This period has faced plenty of changes in schools and the whole system of education e.g. school decentralization and management, reformation of schooling net and structure, new methods of financing, a changed system of Secondary Education Examination, new methods regulating the entrance to higher schools, new educational content and standards, the systems of teachers and executives' attestation etc. The educational establishments have seen endless possibilities of cooperation with foreign partners. Joining various international scientific, collaboration, mobility etc. projects opens up excellent opportunities to increase competencies of all education system participants. It can be affirmed that a similar situation can be met in the majority of countries in Central and Eastern Europe. The fundamental reforms of the educational system have been introduced in Latvia, Estonia, Poland and other countries of this region.

The free market conditions, globalization of production, rapid changes in technologies, market liberalization and building an information-based society create a

highly competitive environment in all countries and make an immediate impact on employee qualification requirements and work methods. Training a qualified expert focused on the needs of the work market and aimed at developing practical skills can be accepted as one of the priorities of the education system. Ensuring high quality education has become a burning problem. Qualified education embraces not only internal business of the educational establishments; it is also a concern of the whole environment. To be satisfied with quality assurance, the society and social partners are actively involved. Quality management in education is admitted as a priority. To be certain about the society members' education that corresponds to the time requirements, the representatives of governmental and non-governmental organizations, enterprises, traditional religious communities, mass media as well as education experts, politicians, employers and other concerned people need to be summoned. Everyone must feel responsibility for the young generation and the future of the country. A similar form of collaboration is extremely important and most frequently produces positive results. M. Lang states that collaboration in educational reform assumes an atmosphere of professional autonomy realized through discourse, decentralization, and professional self-improvement in communities of practice. This implies a participatory process in a common information space that is different from the traditional view in a bureaucratic or expert hierarchy. It has to be discussed and justified in a social context of some sort of commons with shared meaning, values and rules (Lang, 2007).

However, it seems likely that progress in education is impossible without degradation which is an antipodal phenomenon. Along progress in education and its modernization, the degradation processes take place. Educational literature calls it *The Doctrine of the Degraded Education*. Despite all the efforts taken, the level of education is kept down in some countries. The number of preschool education institutions has gone down; the children's state of health and the quality of knowledge have considerably decreased. The prestige of higher schools is under damage. Unfortunately, the scopes of education financing cannot ensure qualified education. The phenomenon of falsified education frequently emerges. The factors determining the latter happening are under discussion. The expert inquiry carried out in Lithuania in 2006, revealed such unfavourable circumstances of falsified education as a negative public attitude to school, lack of competencies of the executives dealing with education policy, bureaucracy, exaltation of learners' rights etc. (Lamanauskas, Aleknaitė, 2007).

An inescapable fact remains that an individual market of education exists. An axiom that the market easily accepts 'high' mastership is known. Another truth is also notorious – teachers (apart from rare exceptions) broke checking their personal educational activity and science (do the latter fields conform to one another). The process of broadening personal theoretical knowledge is very slow. What role does an uncompetitive teacher/lecturer play nowadays? Who is responsible if a teacher/lecturer fails to properly express him/herself under the circumstances of competition in the education market? Why a part of the universities are chosen by a large number of students

whereas the other higher schools feel shortage of learners? There are plenty of questions to be fully answered.

Society and the education market gain greater diversity. More and more educational establishments appear in order to offer a wide spectrum of education services. A net of informal education institutions is actively progressing not only in Lithuania but also in other countries of the above mentioned region. The education 'field' is supported with the new theories that help with expansion of a modern education panorama (Lamanauskas, 2004). Obviously, such variety can be confusing, moreover, the barely accepted objects most frequently do not succeed in becoming the treasure of the educational society. The acknowledgement and investigation of the systemic education reality grow into a burning issue. Nevertheless, variant education is admitted as an index measuring how a certain political unity is focused on different educational needs and possibilities of society and its groups.

A few produced ideas will serve as a pretext for everyone interested in discussing the problems of education and thinking of the present education situation. This is a purposeful objective. The geopolitical situation in Lithuania has performed a role of a bridge between East and West. During the recent seventeen years, the one-way direction has predominated and been targeted on the West traditions in Lithuania. It is clear that education encountered a similar situation. The state of education in the region of Eastern Europe has been poorly discussed. Different international conferences held in Russia and Belarus disclose the need of exchanging information, experience, problems etc. The pedagogical traditions of Russia, Belarus and Ukraine considerably differ from those cherished in the West. The fact that only a small number of scientists working in the field of pedagogy in these countries publish their works in English proves that the real problems of communicating with one another exist. Life under similar conditions limits the possibilities of acknowledging the educational theory and practice in these countries.

2007
Problems of Education in the 21st Century, 2, 5-6.

FROM TEACHING TO LEARNING: A NEW PARADIGM IN MODERN EDUCATION

CURRENTLY, the main idea, not without reason, is paradigm change in modern education. We can safely claim that the role of education in the global world is, undoubtedly, the biggest comparing with the other spheres of social life. Education dimensions have grown up greatly in almost all countries. Informal education sector has increased immensely. The most modern ICT are being implemented into education system. Perhaps we will not find any scientific conference in which the questions of ICT application in education process were not discussed.

However, it is obvious that education systems in most countries experience various difficulties. It is clearly seen in Central and Eastern European countries, in which the second decade in turn education system reforms of different level and amount are taking place. So called "*Instruction Paradigm / Teaching Paradigm*" has been dominating for a long time in education. In recent years the accents are being transferred to learning, to motivation of self learning. It has been realized, that it is impossible to teach if the person doesn't want to or is not able to do this himself. At present the opinion occurs that it is impossible to teach another person, it is possible only to help him to learn. From this as if directly follows the statement that the responsibility falls on the student first of all, what, how and how much he/she will learn. However, didactically it is a totally wrong approach, especially when it is applied to junior forms of comprehensive schools. The systematization, deepening, formation of general concepts can't be left for the student himself, because frequently it happens that students master the new things which are related to the old ones without their interrelations, without any system (Vaitkevičius, 1968). Ability to systematize information is one of the most important. As J. O'Connor and Mc.Dermott (2006) notice, there is a very remarkable tendency in many spheres nowadays, to solve everything „in parts", i.e. to analyse different phenomena and situations only in separate aspects. From this point of view, transferring education aspects only into learning is not fully grounded. Each learning personality is very different, therefore different approaches should inevitably be applied in teaching process.

On the other hand, education quality in many aspects is getting worse. We can‘t claim that education quality is getting worse because of former mentioned paradigm change. Lithuania as a post soviet country has a many year experience when education, especially secondary, was unified. However, it is necessary to emphasize that education at that time was also better supervised. We can‘t say that there is no supervision nowadays. It really is. But, everlasting reforms, sometimes even opposing to each other, don‘t make Lithuanian education more effective. As professor G. Merkys noticed, the therapy of shock continues in Lithuania. We not only have to think about this but, of course, solve the problems arising in reality.

Speaking about Lithuania, it is obvious, that now it is very important for our state what decisions and steps, what ideas and actions in the sphere of education we will suggest and implement. 2006 PIRLS research shows that the ability to read and understand fiction and informative texts of our country 4-th formers has declined very much. 2006 PISA research states that natural science, maths literacy and general reading abilities of our 15 year-older are by statistics significantly lower than OECD countries‘ average result. Though Lithuania is not at the end of country list and it seems that the results are not so bad but the matter is worth of concern. The results of the research highlighted one of the most sore points of education that the preparation of our students for practical life is still poor, the main attention being further concentrated on theoretical education. Theory without practice is not the goal of today‘s teaching. We can discern here another meaning of the mentioned paradigm improvement – from knowledge towards the development of abilities. In the ability development process the learner himself has to take part most actively. The mission of education system is to form suitable conditions for that purpose and give all round help.

Other countries like Latvia, Estonia, Czechia, Poland and other have serious problems in education sector as well. Obviously, every country has its own traditions and context. Besides, education is a part of culture. In this case we are speaking not only about national cultures but also about common European culture. We are speaking about common European education standards. The question arises how to match national and European aims. Any school has a challenge to create the future of the state. Education reforms have been going on for more than ten years in several countries with the purpose to achieve higher education progress and to implement the latest innovations. However, attitude to changes and innovations is not the value on its own. Changes have to be conciliated with the basic human and nation values. Modernization is a very necessary and inevitable thing, however it doesn‘t have to dwarf the vision of the school mission. Among permanent reforms direction and vision of the whole education purpose shouldn‘t be lost. This applies not only to Lithuania but to all European countries. I would like to go back once again to our mentioned paradigm change. The implementation of innovations into education doesn‘t have to overshadow the good side of education experience. Not everything that is modern is sensible. For example, Lithuania as well as the other countries of central Europe has a many year

tradition when the priority was given to strong knowledge and to education basis in general. Lithuania hasn‘t lost this tradition completely and that is good. The main goals of education are: to help to form knowledge system of a learning person and give him basic social communication skills. Knowledge is not everything in person‘s life. Not only knowledge makes the man. However, we have to agree, that without its powerful movement in history, mankind wouldn‘t be as it is. The progress of humanity in many ways is conditioned by the development of knowledge, its expansion and so on. Thanks to it the greatest changes have taken place. School doesn‘t have the right to doom children and youth to ignorance.

It is not difficult to foresee necessary changes theoretically, to discuss about paradigm changes on a methodological level, but it is much more difficult to put these ideas into practice because of various both subjective and objective reasons. It is necessary to really perceive the mission of education and other questions of education, to analyze them from different perspectives, taking into consideration different theoretical and practical approaches. Education is not a one-day matter. The rule ‘Education is in the hands of those who have power’ doesn‘t suit here. To develop education is almost to be ready that everything what is moral in your mind will inevitably be overcome by immorality of real world (Butvilas, 2006). Education in the socioeconomical and cultural context is multiform. Therefore, we can‘t one-sidedly accept a statement that moving from teaching to learning is a new paradigm indeed. Its newness is limited by time, amount, content and application aspects.

2008
Problems of Education in the 21st Century, 4, 5-6.

EDUCATION FORTUNES AND FAILURES: BETWEEN TENDENCIES AND CONTINGENCIES

IT seems to be a paradox that frequently initiated political decisions in the field of education influence the expected alterations as well as a number of negative factors. Recently, the quality of education has been devoted meticulous attention. There is no doubt it is a pressing matter at all levels of the education system. Every stage is specific and encodes the fortunes and failures of the following stage. The one, who obviously failed to succeed at the very beginning, can experience arising problems in the future. First of all, in this particular case I refer to lack of certain education and therefore, probably no one can be blamed as the education system is often found guilty about the situation. The education of the post soviet countries encountered a variety of fortunes and failures. On the one hand, the reforms of the education system were an inevitable and necessary process. A worse point is that in certain cases, they became sustained, ongoing and not preserving the established order, and thus caused discontent at a varying degree. For example, applying the so called modern ICT in the education system was not always a clever idea as only later it was perceived that the technologies themselves brought no success. Skills at purposefully using them, abilities to effectively apply the required equipment in practice etc. are necessary.

The rejection of the identical programmes of general education in a number of post soviet countries including Lithuania, Latvia and Estonia can be accepted as success. Up to 1990, all Baltic States used the same course books as in the former Soviet Union. After gaining the independence, an underlying update of teaching content at all levels of the education system started. First original (not translated from the Russian language) course books appeared. In a few years time, first course books written by the European authors were published. However, didactically, these were not particularly suitable for Lithuanian students. For example, for more than ten years, the Latvian students of comprehensive school have been provided the possibility of choosing a learning curriculum. Although at previous times, they had a chance of selecting teaching subjects, still the latter principle did not satisfy expectations. A number of disagreements on bringing profiled teaching in practice occurred in the year 2000 (Lamanaus-

kas, 2000b). The prospects and reality of the former education reforms taking place in Lithuania were openly discussed (2000a). It was expected that the then chosen model would ensure the individual possibilities of free choice. However, it can be stated that to a larger extent the implementation of the model in Lithuania did not succeed. After making the major transformations the initial model was withdrawn. It is clear that not all students are equally good at all subjects taught at school. Although the idea of profiling was brilliant, however, the chosen strategy for implementing things in practice had not been properly checked considering the prevailing conditions in Lithuania. Another important aspect is that this seems to be one of the ways to deny the core of comprehensive schooling. Though rather selective education systems exist in a number of European countries (for example, in Germany), too early specialization contradicts the conception of general education as the one graduating secondary school, must receive thorough education. Certainly, an opponent should state that presently, almost there is no country that should not provide a child with the possibility of choosing at least a part of educational content. Even supposing it is true, who can ensure it is a careful, well-balanced etc. choice. Since 2007, controversially evaluated profiled education in the Lithuanian establishments of comprehensive education has been changed to a less elaborated system that allows the learners to individually decide on 40% of the subjects they want to be taught. Following a new requirement, a basic school graduate first of all, must choose not the profile but at least nine subjects from the basic school curriculum and almost the same number of the optional subjects.

Another failure is that up to now, no equally qualitative education has been guaranteed for students neither in Lithuania, nor in Latvia. Despite the fact, that conditionally the above mentioned countries are quite small, the level of social isolation varies to a large degree in the city site and the rural area. In the majority of cases, financial support for education institutions depends on municipalities as these promote the latter establishments and are responsible for providing the required resources which definitely worsens the quality of education in general. Secondary schools were transformed into the institutions of basic education whereas the former basic schools were either closed or reorganized into the establishments of primary education in the larger part of rural areas in Lithuania. Such situation cannot be explained referring to demographic arguments, for example a decreasing number of learners, which on the contrary, facilitates higher quality education, as having the same financial resources, the number of students remains reduced and therefore more attention can be devoted to teacher training etc. Modern technologies and a smaller amount of students in the classroom create conditions for every learner to work out an individual plan of education that helps with introducing a personal style and pace of studying. In this case, the larger part of countries supports the idea of individualized teaching.

Strong competition, general instructions on enrolling in the Lithuanian institutions of higher education and students experiencing pressure of their parents ignoring natural children's abilities to learn have a negative impact on education. To organize

the process of total enrolment, all universities in Lithuania have formed an association. A number of young people break studying due to the wrong choice of a subject. For the last few years, the regulations have specified that up to 20 positions pointing out the chosen curricula of studies can be included in the application form. It is an opened lottery. The results of random enrolment are dramatic. Statistics shows that students' options frequently do not correspond neither to their interests nor individual possibilities. The annual average of people eliminated from higher and vocational schools makes more than 20 000. For example, in the school year 2003/2004, 378 in 10 000 citizens of Lithuania were studying in universities. Under statistics provided by the Ministry of Education and Science of the Republic of Lithuania, more than 70% the same year secondary school graduates are still studying in the institutions of higher education (44% - in universities and 23.8% - in colleges) http://www.smm.lt/. Thus, on the one hand, the number of students constantly increases, on the other hand – the required financial support cannot be guaranteed, and therefore the quality of studies remains reduced. The Rector of Vilnius University suggests that if a number of students having no motivation enter the university and study no matter what they get, logically they fail to qualitatively study (Juodka, 2007). Another evident failure of education policy is that the number of managers having a doubtful qualification is increasing while that of qualified workers is decreasing in all three Baltic States.

The problem of teachers' social status can be accepted as a serious failure in some post soviet countries. Though education in Latvia and Lithuania is considered to be a priority field, nevertheless teachers' remunerations remain really poor. Such situation does not attract qualified teachers to work at school. They must work longer hours and sometimes increase work load twice which prevents them from raising qualification, training courses and professional advancement. For the last few years, the trade unions of the above discussed countries have been fighting for their rights so that they would be honestly paid for the work they did. Periodically performed protest actions and strikes do not help with achieving main political decisions.

A positive point is that all three Baltic States are closely collaborating in the fields of policy and education. The latest statistics and research have disclosed that the achievements of Estonian students surpassed those of Lithuanian and Latvian learners. The Latvian students of upper secondary school (forms from 10 to 12) were provided with new equipment necessary for laboratory experiments in sciences which is a very complimentary decision. During the last 15 years, an interest in natural sciences has remarkably decreased, is negatively evaluated by the majority of people and certainly will have a damaging impact in the future. A relevant task that should be undertaken by the Lithuanian Government is to arrange school network and properly supply schools with necessary equipment. However, a matter of concern is frequently and motivelessly closed schools having a small number of learners. The decrease of schoolchildren is not the major argument about the closure of school. In the majority of cases, the schools located in the rural area are the only focal points of education and culture.

Therefore, the space of education in the Baltic States can be more or less treated in a similar way. It is likely that a close collaboration in the fields of education and policy will be central issues in the future. The Ministers of Education and Science of the Baltic States regularly discuss achievements in education in each of the countries.

The problems of education fortunes and failures have been briefly discussed. Even such a subtle point of view should encourage researchers to more critically analyze the phenomena of fortune and failure in education. Quite a few failures were obviously programmed in the past and retrospectively can be accepted as a tendency. A number of things are being programmed nowadays as this is the way to programme the future of our society. Is it a tendency, contingency or both? Sinergetically, contingency can be accepted as creative constructive antecedent. With reference to education, it has a positive shade because of the power pushing forward the tendencies stimulating the growth of education planning and efficiency.

The present and future education policy is definitely related to globalization and rapid changes taking place in society which is a real information revolution connected with the use of information communication technologies. It is clear that the countries that intended to change the education system and thus society itself had approved purposes. Some goals were achieved whereas a part of those were not attained. There is no excuse for a strong wish to intercept experience of the Western countries as the latter situation prevented from solving local problems. Therefore, a pertinent question *whether we have our own science and education policy and a future project or only blindly follow things occurring in the West and enthusiastically take them over* arises. An objective to change things and be changed is welcomed. It can be emphatically affirmed that education is able to change society. However, are the politicians competent enough to change education itself and create the required conditions for changes in education? The increase of reforms at different level is determined by gaining certain freedoms. Nevertheless, the main problem remains the same – how to combine the previously launched various projects on the reforms of education into the wholeness in order to achieve better implementation of the projects through coordinating them and how to succeed in getting the best results. Losses and failures have never been ageless as they can be treated as general systemic regularities. It is the time to take control over, predict and learn from the failures of education. In the end, a controversial question asked by A. Bloom *Will* future *learning be in tablet form?* can be repeated.

2008
Problems of Education in the 21st Century, 6, 5-8.

DISAGREEMENTS AND PARADOXES OF EDUCATION

Listen, watch and keep silence if you want to enjoy life...
Heritage language

Introduction

WHY the 21st century scholars start raising their voices while facing troubles and difficulties in the field of education. To identify the situation, it is worth having a closer look at the present schooling system. Post-modern life and education more and more frequently are coming into force. Superficiality becomes a common phenomenon. Only available regularly used and easily with no effort achieved attractive things are greatly appreciated. What is more, only minimal efforts are taken to gain a broader educational background. Quite a few countries display similar tendencies. On the other hand, education is frequently treated as a product or a kind of service. The laws of the wild market fail to get round this area of life. The chosen life style (including education) rather than the meaning of life and education itself often play a crucial role.

Living with disagreements on education!

There is no need to be an expert perfectly knowing matters of education to find out not everything works in the system of education. Also, it seems to be clear that the evaluation of those working in the 'fields' of education cannot be rejected. I suppose the latter are not the majority as more and more frequently 'strangers' gain access to the education system. Discussions with the representatives of other countries have revealed that those currently studying educational subjects at universities usually fail to understand what the school is and what role they are going to play in this institution. The most important point is studying and receiving a diploma. Modern education encounters a large number of different problems the answers to which can be hardly found.

Thus, the very first disagreement is one between the necessities of providing a creative, socially changeable and alteration determining environment and the prevalence of applying verbal-bookish methods for educational purposes. Although teachers expend enormous efforts, a decision on the above mentioned disagreement is not

reached and only a very slight hope can be seen it will be made in the future. A similar situation exists while generating a discussion on the need for 'having the lead' in the field of changes (alterations) and a conservative education system reflecting the already produced changes in life. To some purpose, a teacher (present) brings past (knowledge) for the future (children). No one can deny that another disagreement can be noticed which is one between the need to purposefully pedagogically manage the development of every single personality and actually existing dissolution of the educational process (unreal separation) combined with the inconsistency of pedagogical impacts (teachers often work separately from one another on the basis of their personal knowledge and understanding). Despite taken into account all wishes the presently observed abundance of different guidelines and reorganizations remains broken into pieces. The suppression of such situation is a regular event proposing this is different. A number of produced theories about how to make the educational process more effective are left unrealized due to various reasons. First, schooling practice is something different. Theories lose their vitality. On the one hand, requirements for how to increase activities of learners as the main subjects of the educational process are imposed, whereas on the other - their status stays passive and similar to that of passive objects having a pedagogical impact which is objective truth as in the binary process of the interaction between learner and teacher, their activity has inverse correlation. High activity of one of the components holds down activity of the other. Systematically, any kind of education is more or less constraint. Education, as a rule, is organized, purposeful, coordinated (being coordinated) activity with objectives established by a certain society (the so called social order). However, a problem of how to achieve a proper balance between the elements of constraint and personal freedom occurs.

Though an emphasis is put on the necessity of making the educational process more intensive, nevertheless, extensive ways of improving it are actually prevailing, e.g. the number of lessons increases, different informal educational activities are undertaken etc. In this case, another disagreement between the continuous quantitative development of the education system and a consistent increase in education quality can be noticed. The latter process goes with the depreciation of evaluations (points and marks) and diploma. The analysis of university curricula in some countries reveals that these documents suffer from a lack of holistic planning and clear philosophical proposals. The introduced situation results in a compilation of incoherent courses and is particularly faced in the countries of Eastern and Central Europe, the places where unified education has prevailed for a long time. The rapid diversification of education is a common occurrence often taking the wrong move. Influenced by the regularities of the market, in the name of survival, schools usually sacrifice the quality of their activities in a broad sense.

'Buying' diploma is another related problem. Quite a few discussions have been generated and will likely be held in a number of countries in the future. The Internet is full of web sites offering similar kinds of services with the established prices. Thus, the

market imposes the rules of the game. Supply and demand always go together.

Despite the fact that a continuous process of increasing the volumes of scientific and social information is taking place, however, limited terminology on learning/studying used by educational establishments is regularly observed. Moreover, the Bologna process requires cutting the standing of studies. No attention is paid to the evaluation of the promoted idea. The pace of life necessitates growth in any area thus leaving behind rivals etc. Nevertheless, the logic of life clearly shows that when gaining one thing you lose another. There is no question of getting anything you want here and now. Everything has a price, and therefore the only question about how expensive, when and to whom money will be paid needs to be answered.

Disagreement between an objective need for a continuous improvement on educational content (is there anyone who will dare to say it is needless) and a traditional pedagogical requirement for ensuring the stability of educational content is another field of the initiated discussion. A try at improving things is closely related with the extensive development of education, for example, more and more alternative course books and information sources for learners are prepared which disintegrates the content of education. Disagreement between the increased abstractness of education influenced by growing theoretical knowledge and the necessity of improving practical learners' training should be mentioned. An opinion that the process of learner/student training is too much theoretically supported can be frequently heard. In this case, a huge number of reasons could be suggested.

Employers also often complain that the young generation coming onto the market is not properly trained. However, the other side of the medal exists. Some of the teachers either have no connection with practice or it is very weak. Therefore, the only decision to be taken is to prepare the would-be specialists on theoretical grounds. Disagreement between the increased degrees of education and the importance of educational individualization in order to show the immanent powers of every child (learner) should be considered. In most instances, comprehensive school keep these powers unnoticed and unexpanded. To some purpose, the U.S.A. always refers to the priority of making education individual. Therefore, in this case, a question of how to achieve a balance between mass and elite education is faced. Every country is confronted with problems common for a certain area.

An interesting disagreement occurs between objectively growing public demand for having creative, highly qualified teachers/lecturers and limited possibilities of satisfying such need. As mentioned above, more and more schools fail to choose strongly motivated personalities able to get on with pedagogical work. First of all, this should be a concern for those formulating educational policy at different levels.

Information sources suggest that regarding education, a public opinion of quite a few countries is highly positive and this makes us feel happy. However, on the other side, regularly disseminated information that public gladly accept provided education seems to be too provoking in order to hear the opinions of colleagues from other coun-

tries and to realize that work at school becomes more and more arduous. During the last few years, several countries have faced strikes and protest actions organized by teachers' organizations. On the one hand, public requirements for increasing teachers' professional skills are constantly growing, whereas on the other, individual teachers' possibilities of 'catching the right pace of life' remain objectively limited (time spent for self-training decreases). Different types of attestation, teacher training etc. prevent from concentration on the main subject – education in the classroom. Society has an abstract position on the issue that their children should be provided with an appropriate background, and therefore it has cherished a false hope for versatile harmonious education. With reference to such situation, education players neglecting control functions and ability to think often transfer all subjects and create adverse circumstances and heavy physical and emotional overload. This is a frequent discussion held by physicians asserting that students and teachers' state of health is getting worse. The so called state owned comprehensive schools fail to provide the learners with expected education. To solve these problems and compensate misfortunes, private tutors are called for help.

Another disagreement is worth being discussed. Education requires more and more investment, particularly reformation of education systems (for example, the U.S.A. spends approx. 300 billion dollars annually). Nevertheless, different international investigations reveal that education quality is being reduced. For instance, presently, Russia more and more often comes across the doctrine of degrading education. Finally, from a financial point of view, various types of reformed education are recipient. The forthcoming result can be hardly predicted. Time is also an important factor as negative after-effects can be visible following the required amount of time. In this case, new reforms are usually introduced and the cycle is repeated again.

Another disagreement is extremely controversial and can be either accepted or rejected. Civilization is not being created by bright students who were brilliant at all subjects studied at school and not by those awarded gold medals, but by ordinary learners who were often ignored by teachers and never had a chance to study at a college or university.

Certainly, even more objectively existing disagreements can be discussed. However, the problem is not the one they cannot be properly resolved as first of all, they need to be indentified and only at a later stage - possible ways of finding an appropriate solution should be developed.

Common education paradoxes

The above discussed paradoxes are closely related to the so called education paradoxes worth being looked over.

The first paradox to be mentioned is the one that human have different rudiments of physical and physiological experience, and thus their education entirely depends on them. When children are 'placed' in the same school to be properly educated, even

pressure on them cannot help with achieving good results. Parents prefer their children should be tutored in subjects that hardly ever will bring success in the future rather than look for ways of developing their innate abilities. On the one hand, these are additional income, whereas on the other – expenses and health problems. In another way, tutors are not always teachers having necessary qualifications. Tutoring is an old phenomenon widespread in all countries at all times. The conception is similar at all points – a person providing a learner with additional lessons on the subjects difficult to be acquired at school (the learner is either has no wish or is not interested in dealing with learning things). The carried out research points out three main criteria for taking a tutor: preparation for the final exams, to make the taken course more systematic and to better acknowledge a particular subject. The latter involves the second paradox – motivation which is the driving force of teaching (learning). In an opposed way, motivation may 'prevent' from the teaching (learning) process. The genetic system determines the purpose of self-realization. One type of activity is easily accepted and stimulated, the other – ignored (only obeyed and imitated) and the third type is not suitable to perform any action despite all possible didactic methods and even coercive measures. In this case, the effect achieved by the tutors is temporary and has no sense. This event is stimulated by a policy of general education inadequate for the existing situation. It should be taken into account that a teacher is one of the oldest professions. However, like thousands of years ago, s/he tells stories, explains ideas, imposes penalties, encourages and makes evaluations. Although psychologists agree that children's cognitive activity in the classroom plays a crucial role, teachers suggest it must be under control and at minimum expenditure (economists' point of view). But what is the right option when classrooms in schools are overloaded? Finally, who will dare to point out the exact number of children in the classroom in case we admit that individual education is the most effective? The number of learners in the majority of African schools makes 45 – 50 students. In some countries of the continent, the amount of those is even higher and reaches 70. Though the situation is different in other countries, still, it depends on the variety of circumstances, not only on economical potential.

One more paradox should be explained. A teacher plays a leading role which is reality that cannot be denied either by the wide society (masses) or politicians and other members of public (elite). Nevertheless, the fact of teachers' remuneration for the work they do shows different. There are only a few countries where teacher's job is a highly-paid one.

Systemic paradox should also be highlighted. All elements of the education system have plenty of drawbacks, and therefore the whole system as such contains defects. A partial modernization of the system has no sense (following the principles of system functioning, any implant will be rejected). Any system can be replaced with the one that seems to be more attractive. Those responsible for education policy and execution often choose the easiest way based on steeling ideas or plagiarism, i.e. they combine different reforms and put the models developed in other countries into practice. Nonetheless,

it does not mean that the same model gladly accepted in one country will be successfully adopted in the other. Then, we are proud of how clever we are and what great our achievements can be. Such 'implants' very frequently fail in succeeding and turn into 'horrible' disasters.

Forming classes in schools concerning age can also be treated as an intriguing paradox. When a part of schoolchildren get bored, the others encounter difficulties. Consequently, the new methods of teaching (for example, 'active' methods of teaching) are introduced. Why not to form classes taking into account cognitive abilities, thus leaving behind this problem forever? Establishing the terminology of general education is another ambiguity. Why must all learners 'sit in the classroom' from bell to bell all year round until they have graduated from school? Setting an individual pace should be a more rational decision and help with gaining formal education at different time of studies.

Epilogue

Life and education with no problems is a hardly acceptable idea. However, a wish to stay at a distance in order not to face the existing problems is one of most awful disasters presently seen in the education system. It might be money can solve all problems as according to Marx, 'They have by no means merely one mode of affirmation, but rather that the distinct character of their existence, of their life, is constituted by the distinct mode of their affirmation. In what manner the object exists for them, is the characteristic mode of their *gratification.* Wherever the sensuous affirmation is the direct annulment of the object in its independent form (as in eating, drinking, working up of the object, etc.), this is the affirmation of the object... By possessing the *property* of buying everything, by possessing the property of appropriating all objects, *money* is thus the *object* of eminent possession. The universality of its *property* is the omnipotence of its being. It is therefore regarded as an omnipotent being. Money is the *procurer* between man's need and the object, between his life and his means of life...' (The Power of Money, Marx, 1844) I strongly reject this idea. The problems of education cannot be solved only on financial grounds. Everyone figures out that vast and broad knowledge as well as full understanding are required to overcome the encountered problem. Education is not a stable system made of insecure and poorly defined components. To find it more reliable, it must contain excess supply, i.e. guided by the principle of redundancy. More investments in education are necessary so that to expect at least minimal results and it makes no account that this idea passes over the presently prevailing liberal economic logics.

2010
Problems of Education in the 21st Century, 20, 5-9.

THE DOCTRINE OF DEGRADED EDUCATION: BETWEEN MYTHS AND REALITY

In lieu of Introduction

THE title does not promise a positive attitude towards education. The reader can feel impressed that the only purpose of the author is the criticism of education with no positive points. However, this is a wrong position as any vivid detail can be clearly noticed. On the other hand, both positive and negative sides need to be considered and in this case, improvement and modernization are not the only ways. A steady increase in welfare is a myth, thus there is no need to discuss which area of life looks is described. When mentioning progress in education and modernization, we must face the other side of the road full of phenomena of degraded education which is not new in Lithuania. The last decade has generated discussions on this issue at different levels, although this is unfashionable and finally useless from different points of view. The most pressing problem is that the concept of degraded education has not been accepted as reality up to now. Therefore, the above introduced points should be plausibly argued.

What is Degraded Education?

Before starting a brief discussion on the conception of degraded education, it should be taken into account that the meaning of degradation covers decline, deterioration, degeneration etc. Similar explanations are provided by almost any dictionary. Let's agree on the point that discussing a decline in education analyzing different constituent parts (lifelong learning, global education, information and knowledge-based society etc.) of this process is neither a modern nor rational idea. As a minimum, the author is at risk of staying in a position of a running opponent.

Nevertheless, let's have a look through two basic components of this doctrine – corruption and falsification of education. Presently, corruption (phenomenon of corruption) has been widely discussed. A part of the society claims it is simply a myth,

whereas the others agree it is more than clear that corruption is taking leadership. Both positions are likely to be true. I support an idea this phenomenon cannot be absolute. However, long-lasting research has revealed that the scope of corruption is successfully growing and first of all, due to competence in this area of life. I submit that the scope of corruption is the exact indicator showing the need for competence in a certain country. I am more than confirmed there is no price for buying competence. One can buy "a paper", i.e. a school leaving certificate, a diploma but not competence which is not sold anywhere as must be personally acquired and developed. The reports presented by the United Nations only indicate that bribery and corruption make damage to universities and schools worldwide. Human indifference, materialization, self-prominence and desire for obtaining anything and everything anytime you like are the key stones of increasing the level of corruption. Thus, a question whether anti-corrupted education is an efficient means for dealing with the encountered problems arises.

Education falsification is the second element of the doctrine of degraded education closely related to corruption and other maladies. Falsification can be accepted as the process of distortion, manipulation and changing real things with the false ones. Such phenomenon reminds me of 'erosion' causing problems 'inside' the education system. Analogical thinking helps with understanding that we need to protect our society from such erosion. In this case, a suitable way of considering these problems should be taken into account. First, it seems to be a hard task as this occurrence is not properly examined. A more appropriate way is discussing things about the currently growing quality of education. However, despite an increasing amount of investments in the field of education, the world faces a tendency towards a decrease in the quality of education. The opponents are frequently settled down putting forward a rather simple proposition that the quality of education is a matter of an agreement. The falsification of education manifests in very different forms, including poorly coordinated curricula and different inadequacies of education when standards are ignored and national objectives and/or activities suffer from a lack of coordination. Some educational establishments usually strive for showing better results than those achieved in reality. In many instances, such situation is determined by a fierce competitive struggle, first of all, taking into account financial recourses. A part of countries strongly feel a shortage of intellectual and material resources which makes a direct impact on falsification. It is worth paying attention these things are not directly related. Quite a few 'rich countries' also face phenomena of falsification the scope of which seems to be rather wide.

The falsification of education closely correlates with different changes in the field of education which is very common in the so called post-soviet countries where during the last 20 years, improvements have been mainly promoted employing imported elements, i.e. learning from foreign experience the thoughtless sharing of which have resulted in numerous distortions and finally failed. An elementary axiom of systems theory suggests that every system makes attempts to reject an alien element.

Sound words about modern school and modern education of the 21st century are very popular. However, reality faces a different situation – up-to-date education emits different lights. The teachers are not those showing their personal qualities of honour and morality and the lecturers of universities a lot more rarely can demonstrate their real authority. Information boom is approaching and the abundance of knowledge requires producing drastic changes in the education system. Making the current system highly intensive is not the right way to escape the encountered problems. The curricula used at schools are overloaded, schoolchildren often feel overstrained. The structure of values is seriously damaged and we become only pragmatic consumers. Educatedness cannot be the only subject-matter. The elimination of values makes it useless as a highly educated clever sneak will cause more danger to the society than a greenhorn. Education is primarily a world outlook. Although it sounds pretty traditionally, understanding good and evil is an exceptional quality of an educated person. What is more, there is no university that can help if you haven't got God's gift.

The Internet appears as a relevant factor stimulating the falsification of education. There is no doubt that the Internet provides a large number of positive things and advantages and that it acts as a powerful tool in the process of creating a knowledge-based society. Nevertheless, presently as never before, the Internet is contributing to an increase in education falsification. Almost every country can offer a huge amount of websites on the Internet with a possibility of obtaining works of different scientific qualification, including BA papers, MA papers and even doctoral dissertations. Such websites extensively discuss the ways of how and why these scientific works are for sale. The number of doctoral dissertations is not that big, however, hardly anyone can deny the fact they are not obtained ordering the required papers. These websites are widely available in the main foreign languages such as English, French, Russian, etc. Obviously, the higher is the level of the research paper, the more professional is the qualification of one who operates such service. There is no way to deny that the employees of our universities are involved in these processes in one or another case. While browsing on the Internet, one can easily identify the websites disclosing information on conditions for how to prepare essays, synopses, term papers, BA and MA thesis, etc. Here is one of the examples providing that 'preparing and writing high quality scientific papers (term papers, BA, MA thesis) on educology, psychology, management, marketing, law, etc. is available'. It seems to be that the number of announcements containing such information is constantly increasing. It could be funny to play a joke whether it is the reason why the number of students is increasing. Moreover, do not forget those avoiding publicity the number of which even larger but they feel quietly and profitably employed. A part of the society believes that students do arduous work while the others have a vision that education and training are extremely efficient and their quality is steadily improving. This is so close to falsification in terms of the true sense of the word. One can have an opinion that there is no need to overemphasize, for example, undergraduate studies as after all, the process of learning goes on and

turns into lifelong learning which recently has become a very common position. Isn't it a reason and original justification for diminishing the basic bachelor's degree giving inadequate attention and leaving them underestimated? Notwithstanding, different institutions of continuing education and retraining go next: pay money and everything will be O.K. After finishing BA studies, keep on retraining.

Early specialization is another no less important aspect. In some countries, including Lithuania attempts to introduce the model of profiled education were made which is another example of early specialization followed by intentions of staying behind students' interests. However, the mission of general education consists of a young personality to observe and accept the wholeness. Higher schools have preferred a narrow way of specialization which is particularly unwise as the fundamental mission of University as an educational establishment is to shape an opinion about the wholeness of the world. The universities providing education targeted for services are at risk of losing the mission cherished for centuries. A position that the basis for any society and its economic development is based on properly arranged higher education is widely accepted.

On the other hand, do we really need term papers or theses? There is no point to buy them as acquiring a diploma you wish is the best choice. One can find such examples numerous in Lithuania as well as in other countries. I personally have experience of observing how school-leaving certificates and diplomas were freely offered simply in underground stations and streets in some Russian cities. Thus, it is also worth wondering that some Lithuanian guy will obtain a diploma of any U.S. University. Similarly to the documents issued by Russian educational establishments, those of any foreign higher school or university cost only a few hundred dollars. In this case, the phenomena of plagiarism are worth mentioning as they are extremely widespread in the educational system and remain the burning issue in the majority of countries. The scope of plagiarism is growing and involves all institutions and areas of science as well as all stages of research and studying (scientists, undergraduate, graduate, postgraduate and doctoral students).

The above discussed two basic elements of the doctrine - corruption and falsification – are not the only attributes as there are a number of ridiculous things to be discussed searching for an appropriate solution to how to reduce negative impacts. The carried out research reveals that students' health is deteriorating, the spread of drug addiction and alcoholism as well as trafficking in young women are growing etc. Similar tendencies are characteristic of the majority of countries and the reasons area both – objective and subjective. One thing is clear - education often takes place outside the political ideas but involves individual battle groups frequently resulting from personal sympathy or antipathy. Slide education policies are truly missing. These provisions cannot be all-embracing despite discussions on the universal and international aspects of education. Every country or region worldwide encounter specific problems and make efforts to solve those applying political measures.

The phenomenon of education falsification is clearly expressed and involves a great variety of problems, including education quality, shadow education, corruption in the education system etc. The before mentioned phenomenon comprises educational effectiveness and social justice.

Short Epilogue

None of us are Alpha and Omega and thus cannot claim to any ultimate truth and wisdom. Some empathically say that education should solely operate on market conditions (liberal approach), whereas others argue that education should remain the exclusive property state (conservative approach). Both 'camps' fail to find a consensus. It seems to be unlikely that education can be developed on the basis of market mechanisms. In this case, education cannot respond to the great expectations of a certain nation, particularly a small one. On the other hand, education cannot be 'simply dropped' in the shell of conservatism. How to find the right balance? In any case, we cannot stay away and allow the devils 'drowned' positive things. We need to carry on discussing the faced problems. Though the battle between good and evil has been taking place for ages, today, the balance is clearly violated. Famous French philosopher Jean Antoine Condorcet declared that 'there are two key causes of social turbulence – state / existence inequality band educational inequality'. Thus, save our careful, responsible and public character.

2010
Problems of Education in the 21st Century, 23, 5-8.

SOME FEATURES ABOUT THE ISSUE OF FALSIFIED EDUCATION

THE phenomenon of falsification is becoming more and more interesting and relevant. This phenomenon is related to all educational areas. Such important areas as quality of education, management and funding of education, recognition of qualifications etc. are often susceptible to falsification.

Recently, careful attention is paid to the questions of education quality. The systems of quality management are created, services are certified etc. However, along the process of modernization the degradation of education is taking place. Falsification hints are accepted as evidences of degrading education. At present, the problem occurs due to actual insufficient data on the conception of the degradation of education and the actuality of the latter phenomenon in the Lithuanian education system.

In order to define the conception of the falsification phenomenon, first of all, the semantic meaning of the word 'falsification' must be worked out. The dictionary of philosophy (2002) interprets falsification (*Latin* falcus - fictional, deceitful + fecare - make) as substantiation of falsity contained in a proposition, evaluation or theory. To falsify means to show something groundless. The dictionary of the Lithuanian language (1969) describes falsification as distortion, making something wrong, unreal, illegal (the falsifier - the person who is engaged in falsification). The Dictionary of International Words (2001) falsification explains as conscious distortion, illegal change (lat. Falsifico – *falsify, manipulate*). The concept of falsification in the education system frequently covers such elements as data falsification, corruption, plagiarism etc. and is a widespread phenomenon under conditions of global education and economy. Even the most prestigious foreign universities often face the appearance of the latter phenomenon. It worth mentioning that Massachusetts Institute of Technology's dean of admissions has resigned after admitting she 'misrepresented' her academic credentials on her resume (Education News, 2007).

The phenomenon of falsification is a complex and multiple subject. It is not new in the education system; however, recently, its expression alters. The foreign scientists actively examine the problems of falsified education (Black, 1962; Rocco Vanasco,

1999). J. Hallak and M. Poisson (2007) maintain that education is an endangered resource, because often quality is low, efficiency weak, relevance questionable and wastage significant, while aims and goals are frequently unclear. E. Katiliūtė (2003) highlighted the main issues arising in the common space of secondary and higher school: shadow education expresses itself in a shadow combination between comprehensive school and the system of national exams and include private tutoring, expression of unequal possibilities in the system of national exams and different procedures for entering higher schools. Also, we can find different data about such phenomenon, for example, according Wall Street Journal 34% of all application forms contain misrepresentations about the applicants' experience, education, and ability to perform essential job functions or according ADP Hiring Index 49% of employment, education and or credential reference checks reveal discrepancies in the applicant's information (The Importance of Verifying Education, 2007).

In 2002, Open Society Fund Lithuania and the Centre for Education Policy at Vilnius University carried out research on private tutoring. Although the impact of private tutoring on the education system can be hardly evaluated, the latter topic has not been properly investigated. However, the numbers received to summarize the results of the above mentioned research are very impressive as in 2001, the school-leavers' parents spent approximately 25 000 000 litas on preparing their children for the final exams of secondary education. A comparison of shadow education price and 'Student Basket' which is amount of money donated by the Government for learning purposes reveals that the average expenses of a single school-leaver for attending private classes reaches a half of this amount

Corruption is another negative phenomenon that occurs in the education system. Corruption is obviously a common problem at national level. The international organization 'Transparency International' fighting against corruption has presented the data that in this case, the situation is getting worse in Lithuania. The organization underlines that corruption in higher schools is in the third place and follows road police and medical institutions. In December, 2003, the investigation *The Phenomenon of Corruption in Lithuanian Higher Schools* conducted by The National Union of Student Representations of Lithuania mainly disclosed a similar situation. Stereotyped thinking, lack of competencies etc. are the major determinant factors of corruption. However, competence cannot be either bought or sold. One can buy 'a paper' i.e. certificate, diploma but not competence. Competence is not on sale, it must be acquired individually (Lamanauskas, 2000). The other factors are also important: a common Government's position on this issue, a social teacher's status in society and inadequate teachers' remunerations for work they do. A preliminary assessment indicates that corruption is the most common element of falsified education. Corruption 'damaging education' – announces BBC News (2007). Bribery and corruption damage universities and schools across the world, according to a report for the UN's education wing, UNESCO. Recently, IIEP (International Institute for Educational Planning) Summer School

(Paris, 6-15 June 2007) *Transparency, accountability and anti-corruption measures in education* has taken place.

Quality distortion is another field of falsified education. L. Jovaiša (1993) emphasizes that quality is the entirety of characteristics and marks the essence of objects. The question of education quality should be considered in various aspects including elite and massive, formal and non-formal, national and private, democratic and liberal (Lamanauskas, 2004). Education quality is discussed under the law of the Republic of Lithuania (Lietuvos Respublikos ..., 2003-06-28): an education provider is responsible for education quality whereas the Government must ensure the development of an education curricula and its quality. Nevertheless, legally a learner must receive high quality education. It can be maintained that the question of education quality is solved *de jure*. Yet, consecutive research of education condition can show if laws are followed in practice.

From the teachers' point of view, the conception of falsification can be expressed through distortions in national education policy and bureaucracy. The main factors determining the falsified education are corruption in Government institutions, opaque competition between educational establishments, falsified documentation and ineffective teachers and executives' attestation. The main factors determining the insufficient quality of education are the wrong use of money, inconsistent educational curricula, complexity of educational content, ineffective evaluation system and too many students at school and in the classroom etc. (Lamanauskas, Aleknaitė, 2008).

Free market economy is rapidly gaining ground and the globalization processes become speedier. A similar context widely accepts the importance of education and teaching. A number of countries in our region face typical deteriorative tendencies which increase the relevancy of education quality of all ages including children, youth and adults and the need for life-long learning. The crucial points are an acknowledgement of falsification examples in education and the ability to find appropriate ways to decrease its negative impact.

Obviously, the problem field of falsified education is rather wide. So, there is the need for open and thorough debate on this issue. Openness and transparency are two crucial keys in this problem solving. Thus, while proceeding with changes in education, publicity and discussions involving the whole society in this process are necessary. On the other hand, education structures are not flexible enough and fail to conform to fragmental changes. Coherent motivated reorganization based on scientific research is needed.

2011
Problems of Education in the 21st Century, 32, 5-8.

THE ”McDONALD‘S-IZATION“ OF EDUCATION: SEARCH FOR FAST RESULTS

THE pace of life forces us in getting everything quickly and preferably for free, i.e. the faster – the better. No matter that fast food from McDonald's simply kills the human organism. The crucial point is that the action itself is fast and cheap. However, I see no sense in discussing the topic of junk food. A better idea is the transformation of the above introduced term into the field of education and debates on "appetite" for learning rather than for fast food. Thus, what are the shown indications? First, it should be noticed that when considering the phenomenon of "fast" training, education fails to retain its purpose, and therefore the systems of comprehensive and higher education appear to be just a blur (Lamanauskas, 2011).

The current education system is significantly underestimated, which is supposed to be the time that makes natural changes in the conception of education. The formulation of education has varied throughout time depending on the culture and traditions of the society etc. Nevertheless, intellectual properties and ethics have remained the core components of education. Hence, the background of the present day is largely overlooked, sometimes, even in hardly understandable ways. What is more, such actions are taken by highly ranked officials or even representatives forming the policy of education. It seems to be that frequently at first glance significant declarations may act as tools for suppressing the real situation; for example, the Bologna process started in 1999 after the declaration *The European Higher Education Area* (EHEA) was issued and adopted by the ministers of education of 29 European countries in Bologna (Italy). A common European higher education area was expected to have been established up to 2010. However, the time of the period for the actions taken elapsed, and more problems rather than received results can be encountered. Thinking about solving the problems of unifying higher education is more than naive. Education offered by the so called "services providing" universities is not that attractive.

The statement "education has no impact on mind" is quite common and reveals some truth inside if we discuss anyhow and anywhere obtained pseudo-education. In case education is decent, it can be treated as a result of mind. These things determine

and correlate with one another, and therefore I strongly disagree with such a superficial interpretation of education. Valid ground for reasoning is that the current situation rapidly changes, and therefore no possibility and need for fundamental education "for life" is required. It seems to be an illusion that prevents from understanding the essence. A number of followers simply have no wish or fail to perceive it. As a house having good foundations, human life has no sense without decent education. The same idea can be put forward defining the society as the wholeness because an educated society is a guarantee of state prosperity. Knowledge, abilities and values are the key stones of excellent education.

Some Sketches of University Education

Although a huge number of graduates are awarded diplomas of higher education, these certificates cannot be accepted as tools for measuring the level of mind. Without any doubt, a certain weak link exists. Along with an increase in the intensity of international competition, universities frequently "fight and compete" for money rather than for intellectual potentiality. If you have enough money, you can study and be easily awarded a diploma. It is not a joke that a student appears at the University only at the very beginning of September for enrolment; later – the so called individual studies. The academic society long before has followed an unwritten rule that the students cannot be poorly evaluated as in this case, we can cut the same branch we are sitting on, i.e. no students – no bread. Though self-support is important, it is not the main point. If studies at higher school are on individual basis, then, what is the purpose for entering the university? The opponents should support this idea as they will provide a number of examples that university education does not make a sound impact on the material well-being of the person. Finally, everyone is somehow involved in self-education at a certain level. Individual studies are possible without any university, and thus plenty of people accept this idea.

The weight of education has remained considerably reduced for some time while some universities perform only a good imitation of the process. Certainly, strong universities are those carrying responsibility for full academic potential for science. Academic staff is the cornerstone of any university. However, in this case, "accidently produced" scientists the number of which constantly increases should be mentioned. This is more than evident when discussing social sciences. Those "accident products" most frequently appear as extremely loyal and flexible persons. They are "beloved" by higher authorities as very often cause no problems and act as responsive promoters. The next stage is clear enough – a circle of followers is formed. Usually such "characters" stay far away from real science - they only perform an imitation of the process. The "personages" having low professional qualification work with students where requirements

are reduced to minimum to reach "status quo". A large part of students feel easiness when lecturers are not strict enough as in the majority of cases they are concerned about the diploma rather than about acquired intelligence. In turn, these lecturers achieve modest success, because the requirements imposed by the students are poor and they enjoy the so called "individual work". Expert visits, curriculum accreditation, etc. are not effective tools for examining the true situation; all necessary reports are "made as required". We know how to adapt *here & now*, and therefore are not tend think that similar activities can lead to very limited prospects. Thinking and acting to the principle *here & now* instead of *there and then* determine the "McDonald's-ization" of education. *There and then* is rejected by the majority of people as in that case understanding requires mind and wisdom. Thus, is this the context for discussions about decent education?

The number of universities is another aspect that is worth being discussed. The debates on this issue never end and even are being artificially escalated, particularly in small countries. Competition in the field of higher education is obviously a hard task faced in the Baltic States – Estonia, Latvia and Lithuania. The conducted analysis of recent discussions held in these countries indicates a position supporting an idea of a drastic decrease in the number of universities thus merging a few smaller universities into a bigger one, etc. The quality of university education is determined neither by the number nor by the size or location of the institutions in the territory of the country. First, this is the government's concern about how to raise the level of youth and public education and to promote intellectual growth. The artificial "optimization" of universities is not effective, except in case of finance. However, where is the starting point showing that education costs nothing and should be cheap? Good education costs plenty of money. What is more, direct and other sorts of investment not always bring benefit. This is a consistent pattern of unstable systems, i.e. the kind of education that really exists. We must invest maximum to expect minimum.

The duration of studies influences the quality of education. In this case, the logic of a common sense is also frequently neglected thus accepting an impact of wild competition. Certainly, the Bologna process simply included much inside. Though the intention was to better, the results were as usual. There is no point of studying for four or five years if the process of receiving a diploma can be easily simplified and shortened. Without any doubt, obtaining a diploma is possible; nevertheless, this is not applicable to education. Therefore, this makes funny when different universities plan to pursue the same studies in a shorter period for the purpose of defeating a rival rather than of reaching noticeable quality effect.

A Diploma with No Knowledge and Values?!

As mentioned above, knowledge, abilities and values are the fundamentals of education. An appropriate combination of these three components ensures decent edu-

cation. Moreover, either complete or in part integration of this pattern into the process of awarding the students diplomas could be a good idea. Unfortunately, we can only state that to service-oriented universities will never guarantee similar integration. An answer to the question *why?* is very simple: present universities are very remote from the idea put forward by V. Humboldt yet in the 19th century and explaining that universities must concentrate on public spiritual and moral education. Nowadays, money plays the crucial role. Prof A. Samalavičius suggests a remark that universities turn into individual holdings, the places where money makes the major part and which are after-effects of a new liberal policy (Samalavičius, 2011). In addition, some actions cannot be attributed to any kind of policy as they are cryptic to be easily perceived. Higher education became a massive phenomenon long time ago. Is this the real reason for triumph? The present university education has been converted into a social standard, and therefore the young generation is frequently involuntary involved into the educational process under the pressure of the family members or a wider social environment.

Thus, the international community accepts the idea that more or less the current society is not ready for challenges posed by the 21st century. The activity of being awarded "a rapid" diploma guarantees neither individual nor social progress. The universities supporting the concept of producing similar certificates take a position of self-defeating institutions.

Education Is Not a Game

With reference to the whole period starting from 1990, the education systems of a number of countries have experienced plenty of different changes a part of which has been essential, unavoidable and influenced by time. Still, a major part of the introduced actions have been ill-considered and unnecessary experiments. This period of time usually appeared to be as a game for education covered by mystical phrases such as balanced education of a versatile person, shaping a learning creative society, etc. Nevertheless, opinions about a responsible society are very rare. An educated person is first of all sensitive and obliged to other people. Education as such used for gaining personal benefit cannot be treated as education at all. We can count numerous "educated narcissists" these days; yet, those working day and night feel no difference.

Knowledge (particularly fundamental), basic abilities, skills and values have almost become a relic from the past and an extremely old-fashioned subject. On the contrary, a conception that learning/studying is serious, arduous and considerable effort requiring activity has practically disappeared. Those defending this position are like "dinosaurs" under the danger of extinction. Thus, "playable technologies" are rapidly moved to the field of higher education. Playing games are possible anyhow and anytime and even you can change the rules if found unacceptable. Although, certainly, these words enclose a fixed dose of "hyperbolization", however, in this case, the truth

makes a substantial part. Higher education cannot be a result of the game. And without any doubt, this is not the game.

If we accept to be living in the 21st century information-based society, hence, knowledge acquisition becomes the real foundation of such a society that requires systematic training, improvements in qualification, etc. Nevertheless, all above introduced ideas do not deny the essence of developed awareness. Recently, the world has counted more than 100 million people participating in e-learning. Moreover, the number of those is steadily increasing. We probably cannot take the position that knowledge and fundamental education are not required. Lately, the findings of the survey conducted by the British company e-Skills (http://www.e-skills.com/) have revealed that more than a half of IT experts in the country does not have appropriate qualification and fail to deal with encountered problems in daily activities. Obviously, consistent, systemic training, education and development are required. First, decent education nowadays means atypical nonstandard thinking and a high level of creativity and mental flexibility. For instance, Massachusetts Institute of Technology, U.S. has initiated a special curriculum that concentrates on transferring the courses of studies to virtual space with free access for everyone. It is supposed that for approximately 10 year period, more than 2000 different learning courses and curricula can be shifted. The experts of the institution have counted that a similar programme will cost more than 1000 million dollars. Another valid point is that the executives of the institution defend the position that such possibilities must be free of charge to anyone, which is direct opposition to the policy focused on the privatization of higher education where everything is only bought. The above mentioned institution is internationally ranked the best **(**http://www.webometrics.info/top12000.asp**).**

Hence, education is not a game, and universities are not "the playgrounds full of toys". However, an impression that the number of such "playgrounds" increases along with a growth in the amount of "players" is formed. We can be taught by others; however, education is our personal business. Finally, an educated person who is acclaimed to be a self-determined, independent and strong-minded man the qualities of whose must be inherited by the nation as a whole is our primary goal.

2011
Problems of Education in the 21st Century, 34, 5-8.

PEACE PEDAGOGY OR/AND EDUCATION FOR PEACE: SOME ACTUALITIES

IT seems, that education questions and problems are analysed rather intensively. Educational researches of various sizes and on various subjects are constantly carried out - both at national, regional and international levels. There wouldn't probably be a country on this planet, in which such theme researches in one way or another wouldn't be carried out. Education is not only interdisciplinary, but a very diverse sphere. Where the man is in action, education is inevitable. If one could have a look at the publications of the education field, one could see that diversity is enormous. Leaders are brought up, career preparation is going on, creativity is encouraged, modern media and ICT are taught to be used, so - called 21st century skills are sought to be educated and so on. To tell the truth, hardly anyone could tell what these 21st century skills are, because hardly anyone could bring oneself to tell what skills will be necessary, let's say, in 2050. However, education is such a sphere, that very often various insights, opinions, positions etc. are spread. This is profoundly called pluralism, there are continual activities. However, if we tried to clarify this a little, we would find plenty of information noise here. How much has it been and is being discussed about various skills and competences? How much is it spoken about digital competences and digital education (digital pedagogy)? After all, what should 21st century schools be? Not only at national, but at international level it is spoken about this. E.g., in the European Commission communiqué (2008) "21st century skills in education: An agenda for European cooperation on schools", it is asserted that in order European schools were able to properly prepare young people for life in the 21st century, it is necessary to take even radical changes. It has already been mentioned, that over the latter two decades, a really big attention has been devoted to education. Having satiated the schools with modern equipment (e.g., ICT), one could think that education problems would be solved. However, in the same EC communiqué it is asserted, that 24.1% of young people (17.6% of girls and 30.4% of girls) poorly read (MEMO/08/476). And that is not all. Education system encounters with much more serious challenges. The information stream growing rapidly, the necessity arises to search for effective education strategies

and ways, but not to turn the system on the extensive way. Some countries, including Lithuania as well, discuss about extending the school year. Such fact only approves the meaning, sense and complexity of education.

It is obvious, that a qualitatively new attitude is necessary to education, notwithstanding this, that education possibilities are wide indeed, there are plenty of intellectual as well as technical means for educational purpose realisation. In any case, values remain the centre of attention. And this is one of the most problematic spheres. One can observe constantly rising conflicts in the world, the consequences of which are severe. The conflicts in the East Europe have been going for several years already. Baltic region states are concerned about the increasing tension between Ukraine and Russia. It is acknowledged, that for Europe it is a serious trial, especially having in mind the Cold war, having lasted for a long time. A serious threat arises for peaceful coexistence of states. All the reasons, determining the conflicts, cannot be discussed here; however, it is obvious that it is necessary to learn and to teach to get on with the countries having different attitudes, traditions and cultures. Not without reason, Pope Benedict XVI on the occasion of the 46th world peace day (2013, January 1st) expressed his concern about peace. In the Pope's message, it is stated, that "…. A demand becomes distinct to propose and encourage peace pedagogy, which requires a rich inner life, clear and firm moral points of view, proper attitudes and lifestyle patterns" (http://www.katalikai.lt/index.php?id=6&nid=8170 The demand for peace pedagogy is inevitable. On the other hand, in spite of various initiatives, a proper attention is not paid to this. In order to seek peace, first of all, one needs to teach it and to learn, beginning from the peace with oneself to the peace with the others. As an example, one can mention the journal "Problems of Education in the 21st Century". This international journal has been published since 2007. Science education studies on various themes are published in it. Almost over the eight year period, 62 journal volumes have been issued, 908 articles have been published. Out of them only three articles analysed peace teaching questions in one way or another (Schröttner, 2008; Ochieng, Cheruto, Achoka, 2009; Msila, 2011). Global education and peace pedagogy relation has been analysed only in one article. The other two are devoted to the concrete other country problem analysis. If we analysed the other science journals, especially those published in Central and East Europe countries, we would notice a very poor attention drawn to peace pedagogy questions. It has been very truly noticed by Navarro-Castro and Nario-Galace (2010), that "humankind needs to take lessons from its past in order to build a new and better tomorrow". It is a very complex thing; it needs to be taught, a holistic attitude is necessary to education for peace. In 2012, the analysis of social education textbook content of the 5th-12th forms was carried out in Lithuania and it was established, that most of the attention in them the authors devote to such national values as independence, self-dependence, freedom and rights, patriotism and national faithfulness (Jašinauskas, Zaleskienė, 2012). Though the mentioned values and their education are very important, however, they are more related with Lithuania's as independent state's

re-establishment. Basically, no attention is paid to such values as solidarity, respect to others, peaceful coexistence. Attentiveness, responsibility, indulgence, respect to the otherness and to others, understanding of the otherness and so on, are the basic values expressing the essence of the education for peace. This is relevant not only to the youth, but to the adults as well. From this point of view, education for peace covers all age groups; it is relevant to all people.

Thus, peace pedagogy, having been rather popular in the years of Cold war, has to come back to the young generation education process, of course, with the renewed understanding, content and realisation ways. Education for peace, as a continual process, leading to peace culture growth and support, should occupy a suitable position in children and youth education in the nearest decades. It can be reasonably asserted, that education for peace is the means, which will enable the societies to solve rising civilisation challenges. Education science theorists, methodologists and practitioners should act together, seeking to prepare new directions, education techniques for peace education. In the world full of constraint, violence and aggression, learning peace since childhood is inevitably important, changing human thinking, forming common coexistence understanding. Going deep into peace problems, it is also important, that neither democratisation nor globalisation and multiculturalism propagation did basically decrease either conflicts constantly going on in the world or disagreements or discords. According to GPI (Global Peace Index), Lithuania is in the 46th position at the moment out of 162, while Russia – 152 (http://www.visionofhumanity.org/#page/indexes/global-peace-index/2014/LTU/OVER. Though it is utopian, however, it would be better not to count such indexes. However, it is a long and complex process. It is much easier to understand conflicts, aggression and violence than the essence of peace. Education for peace is not difference or diversity lessening of the nations and cultures. It is a common goal to create a safe, peaceful and harmonious space, keeping the most important idea – from the peace in the nearest surroundings to the global and universal peace.

2015
Problems of Education in the 21st Century, 60, 4-6.

TEACHER-EDUCATOR VERSUS TEACHER-LEADER

RECENTLY, in Lithuanian educational discourse there has been a lot of discussion about leadership. This has become so popular phenomenon that quite often one even does not go deep into the most important parameters of this phenomenon. Leadership phenomenon is not a very new thing, having started to be investigated more exhaustively as far back as the second half of the 20th century, however, over the last decade a lot of attention has been devoted to this in Lithuania. One can reasonably assert, that this is even a matter of fashion. During the aforementioned period, various questions such as teacher leadership, leadership development in schools (as if everyone has to be only a leader), leadership influence on organisation management and other have been investigated in one way or another. On the other hand, quite a lot of attention has been devoted to school managers, having in mind that they should not be just managers, but real managers – leaders. There is no intention to discuss various leadership concepts or to give any recipes how to turn teachers and managers to leaders. Moreover, there exists a vast diversity of concepts. It is obvious, that poor, ineffective and unsuitable management affects the teachers and the teaching learning process itself. It is logical, that this aspect has to be evaluated, and only people suitably prepared and ready for this should become managers of educational institutions. On the other hand, it wouldn't be fair to identify managers and management with leadership.

It is understandable that in a modern school it is not enough for the teacher to know only his professional sphere. Teacher, first of all, is educator. Such a person has undoubtedly huge influence on the other people, and first of all, on children's personality development. This is not only a professional in his own field, but first of all a personality – a man able to educate, practically develop, psychologically and emotionally improve the learner, to develop a harmonious personality from him, a citizen, a perfect humane man. This namely is the essence of teacher-educator. The future is in the hands of such a teacher. Such an educator is responsible for the bringing up of a fully valued person. He is responsible, one can trust him, follow

him. I wouldn't agree that teacher-leader corresponds to these absolutely necessary criteria. Teacher-educator is both a professional and a humanist at the same time, helping for the young man to find his place in the world and in the society, to reveal and realise his potential, his essence. Recently, a popular statement that a modern teacher should be known having similar features to a business organisation manager is very doubtful. School is not and will never be a trade organisation.

Despite the fact, that education is being tried to look at differently, the central idea keeping the approach oriented to the child, modern education systems still keep on accentuating knowledge acquisition, specialist preparation. Personality development remains overboard. Both in general education and in higher education systems one can notice two negative tendencies. The first one, information stream is rapidly increasing and this leads towards teaching time lengthening, teaching/learning load increasing, the second one, increasing the amount of information, the number of subjects, cognition spheres also increase and so on. Multidisciplinarity is being formed, which causes an information dubbing phenomenon, weakens interdisciplinary integrational relations. In this way, quite a narrow, limited technical thinking is formed, the holistic world view is not formed in the mind of pupils and students.

Very much is required from the teacher today. Only the question is how much is reasonable. He/she is both information renderer and consultant, class leader, senior friend and adviser, researcher, innovator and change initiator, psychologist, organiser, catalyser and so on. It has just become fashionable to write about this, discuss and so on. Still it has to be mentioned, that teacher has to be a modern technology "geek", able "to take a plunge" not only into the real but also into the virtual world. How much logic is in that? Unfortunately, really quite often there is lack of it. As R. Pavilionis (1999) has rightly noticed, material, technological society progress does not condition itself its emotional progress, more sophisticated things themselves do not arouse human perfection. However, in the present technological age it is a rather forgotten thing. It is much more fashionable to speak about competition, settling in the labour market, care about yourself and your well-being. In all possible ways one is asked to get acquainted and master leadership as a new modern life paradigm. And, as it has been mentioned, individual interests are in the centre of attention. One of the leadership propagators A. Havard (2007) states, that leaders are not born, they are made. However, I would like to think contrary.

The educators are born, they do not become leaders by accident. Only teacher-educator can develop a fully valued personality. Education, serving the neoliberal leadership ideology and/or representing it, is a way to nowhere.

Society demands are becoming both more diverse and more complex. The schools find it more and more difficult to satisfy them. However, the incitement to prepare education leaders is hardly the right way. In order to change school and

education, first of all, one must prepare the highest professionality educators. Every teacher is (or can be) a leader in one way or another, because he makes influence on pupils. However, not every teacher is (or can become) a real educator.

2016
Problems of Education in the 21st Century, 72, 4-5.

REFERENCES

Black Donald, B. (1962). The falsification of reported examination marks in a senior university education course. *Journal of Educational Sociology*, *35* (8), 346-354.

Bloom, A. (2008). Will future learning be in tablet form? *Times Educational Supplement*, *4781*, 30-30.

Butvilas, T. (2006). Challenges of postmodernism and education. *Mokytojų ugdymas / Teacher Education*, *5*, 8-12.

Corruption 'damaging education' (2007). BBC News. Available on Internet: http://news.bbc.co.uk/2/hi/uk_news/education/6729537.stm (09/09/2007).

Education News (2007). *MIT dean resigns after falsifying degrees*. Available on the Internet at: http://news.monstersandcritics.com/education/news/article_1297091.php/MIT_dean_resigns_after_falsifying_degrees (09/09/2007).

Filosofijos žodynas [The dictionary of philosophy]. (2002). Vilnius.

Hallak, J., Poisson, M. (2007). *Corrupt schools, corrupt universities: What can be done?* Paris: International Institute for Educational Planning.

Havard, A. (2007). *Virtuous leadership*. New York: Scepter Publishers.

Jašinauskas, L., Zaleskienė, I. (2012). Tautinių ir pilietinių vertybių sklaida bendrojo ugdymo mokyklų socialinio ir dorinio ugdymo vadovėliuose [Reflection of national and civic values in the context of social science and value education textbooks]. *Pedagogika*, *107*, 66-73.

Jovaiša, L. (1993). *Pedagogikos terminai* [Pedagogy concepts]. Kaunas.

Juodka, B. (2007). *Į Lietuvos universitetus gali įstoti kas tik nori*. Prieiga per Internetą: http://www.balsas.lt/naujiena/114999 (2008-05-20).

Katiliūtė, E. (2003). Aukštosios ir vidurinės mokyklos sanglauda švietimo politikos aspektu. *Socialiniai mokslai*, *1* (38), 7-14.

Lamanauskas, V. (2000). Ar rieda profilinio mokymo garvežys? [Is the train of profiled education coming?]. *XXI amžius*, *89*, 12.

Lamanauskas, V. (2000). Švietimo reformos vizijos ir tikrovė [The visions and reality of education reform]. *XXI amžius*, *17*, 5.

Lamanauskas, V. (2004). *Švietimo monitoringo įvadas* [Introduction to education monitoring]. Šiauliai.

Lamanauskas, V. (2004). *Ugdymas: aksiomatinis ir sisteminis aspektai*. Vilnius: UAB „Ciklonas“

Lamanauskas, V. (2007). *Švietimo dimensijos* [Dimensions of education]. Vilnius: Ciklonas, 250 p.

Lamanauskas, V., Aleknaite, A. (2007). Fenomen fal'sifikacii obrazovanija: analiz situacini [Education falsification phenomenon: analysis of a situation]. V kn.: V.I. Levin (red.). *Problemy obrazovanija v sovremennoj Rossii i na postsovetskom prostranstve* (Sbornik statej IX mezhdunarodnoj nauchno-prakticheskoj konferencii). Penza: ANOO «Priv-olzhskij Dom znanij», str. 85-91.

Lamanauskas, V. (2011). „Makdonaldinis“ išsilavinimas: greitai, pigiai ir lengvai, bet neefektyviai [„McDonaldized“ Education: In a fast, cheap and easy way, but ineffectively]. *Švietimas: politika, vadyba, kokybė / Education Policy, Management and Quality*, *2* (8), 4-10.

Lamanauskas, V., Aleknaitė, A. (2008). Falsified education from the teachers` point of view: The results of pilot research. In.: *Психолого-Педагогічні Основи Гуманізації Навчально-Виховного Процесу в Школі Та ВНЗ* (Збірник наукових праць, частина І). Рівне: МЕГУ, с. 356-364.

Lang, M. (2007). How to improve science teaching in Europe: Focussing on teachers` voices in professional development. In.: M.Lang, D.Couso ect. (Eds.) *Professional development and school improvement*. Innsbruck, p. 8.

Lietuvių kalbos žodynas [The dictionary of the Lithuanian language]. (1969). Vilnius.

Lietuvos Respublikos Švietimo įstatymas (2003-06-28) [žiūrėta 2006-04-16]. Prieiga per internetą: <http://wwwsmm.lt/teisine_baze/docs/istatymai/i-1489.htm.

MEMO/08/476, „Gebėjimų ugdymas XXI amžiuje: Europos bendradarbiavimo mokyklų klausimais darbotvarkė“, DUK. Retrieved from http://ec.europa.eu/rapid/press-release_IP-08-1094_lt.pdf

Merkys, G. (2008). Šoko terapija tęsiasi [Shock therapy continues]. *Dialogas*, *4* (786), 8-9.

Msila, V. (2011). Fighting for peace in the South African classroom: Peace education the missing link? *Problems of Education in the 21st Century*, *30*, 74-85.

National Student Clearinghouse (2007). The importance of verifying education. Available on the Internet: http://www.studentclearinghouse.org/dvev/dv_whyverify.htm (19-09-2007).

Navarro-Castro, Nario-Galace, J. (2010). *Peace education: A pathway to a culture of peace*. Quezon City, Philippines.

Ochieng, P. A., Cheruto, L., Achoka, J. (2009). Kiswahili language: A strategy to overcome elusive peace in Kenya. *Problems of Education in the 21st Century*, *15*, 109-117.

O'Konnor, Dzh., Makdermot, I. (2006). *Iskusstvo sistemnogo myshlenija. Neobhodimye znanija o sistemah i tvorcheskom podhode k resheniju problem* [Art of system thinking. Necessary knowledge of systems and creative approach to the solution of problems]. Moskva.

Pavilionis R. (1999). Būti reiškia nepaklusti absurdui [To be means not to obey absurdity]. Kn.: H. D. Thoreau. *Voldenas, arba Gyvenimas miške*Apie pilietinio nepaklusnumo pareigą*. Vilnius, p. 8.

Rocco, R. Vanasco (1999). The foreign corrupt practices act: An international perspective. *Managerial Auditing Journal*, 14 (4/5), 161-261.

Samalavičius, A. (2011). Apie globalizuoto aukštojo mokslo paradoksus [On globalized higher education paradoxes]. *Šiaulių universiteto laikraštis*, *4* (2026), 2.

Schröttner, B. (2008). Visionary educational concepts for global challenges: Global and peace education. *Problems of Education in the 21st Century*, *8*, 118-124.

Tarptautinių žodžių žodynas [The dictionary of international words]. (2001). Vilnius.

Vaitkevičius, J. (1968). *Mokinių žinių gilinimas mokymo procese*. Vilnius.

EDUCATION MANAGEMENT

FROM QUALITY MANAGEMENT TO MANAGING QUALITY: SYSTEMIC APPROACH

"Many might be surprised when they hear that I have never created a long term management plan. Of course, a long term management strategy based on management theory is necessary and important. But if we don't live through today tomorrow will not come. I wonder whether it is possible to foresee what will be happening in five or ten years if you don't know what is going to happen tomorrow."

Kazuo Inamori

THERE have been more and more discussions going on in recent years about the quality of service provided in different level and different type of educational institutions. It is not one educational institution that characterizes quality as the most important priority of the activity. However, one thing is to characterize and declare and another is to actually strive for this quality. In other words, the priorities of educational institutions can be quite different however, it is inevitably obligatory to try to survive in the market. Quality system is one of the mechanisms helping the institution to organize and fulfill the activity so that to ensure its effective work under competitive conditions. Moreover, no institution should wait for its prestige to start diminishing on the contrary it has to do its best to guarantee successful functioning in the future. Thus, the head of every educational institution today has to care about how effectively its institution functions, what are possible ways and methods of its activity improvement. It is not enough to have practical experience and intuition to do this. Theoretical knowledge is necessary here. It is worth mentioning such a relatively new science field as Qualitology; (квалитология-Russian) which by its nature is triple. The essential parts of it are: quality theory, quality evaluation theory (kvalimetrija) and quality management theory. On the other hand, the analysis of quality management problems is impossible without systemology, management, innovation and theoretical and practical achievements in other spheres. Eventually, the most major are international quality standards ISO 9000:2000. Everything is joined here into a closely related system.

A significant thing is quality conception. For certain it is clear that it differs. There is one understanding of quality in business sphere and another in education. And it is natural because education is a specific activity sphere of a society. Despite this, international quality standards are more and more applied in education. We can

mention, for example, international standard IWA-2. These are recommendations of how to apply ISO 9001 in education sphere. Quality standards in education sphere are of the same importance as in other spheres. The requirements in education market are growing constantly. The leaders of educational institutions must know whether the service provided by their managing institution is of good quality. This can't be said referring only to intuition, experience and even to some kind of researches carried out. For that purpose it is necessary to certify provided service. Practically, this is not the object of discussion today in educational institutions. In fact, in Lithuanian higher schools the process of program evaluation, accreditation is going on, in comprehensive schools internal and external evaluation has been started and so on. I'm not going to analyze these processes in detail, but I want to stress that accreditation of programs and different way of evaluation is not a quality management system yet. Certification is practically the only way to prove that quality system is functioning. I would like to emphasize that precise compliance with standards and regulations doesn't mean that certain institution will perform a quality work. Much depends on the other factors which are not regulated.

The essential thing which was realized quite long ago in many European countries is a consequent change of the attitude passing on from quality management to managing quality. The emphasis today obviously has to be transferred from external quality control to internal in order to reduce the number of various controls. As it is known, control in itself is side, not necessary actions which would rather not be taken because they require big financial and other expenses and in the end virtually do not change anything. Therefore, it has to be exactly defined what is going to be controlled. It follows that the organization first of all has to be able to coordinate quality management by its inner efforts. And this is firstly for the purpose of the institution's successful and effective functioning (Lamanauskas, 2007).

Another important aspect is quality education. A person having graduated from an educational institution of any level has to have conditions to acquire proper (quality) education. Finally, international standards require this as well. One of the essential (out of eight) quality management principles is orientation to the consumers. One of the most urgent problems of Lithuanian education is availability of quality education. This requires exhaustive theoretical and empiric researches. Financial difficulties, the shortage of different other recourses, various indeterminations and similar issues hinder the solution of this problem. It can be safely asserted that the quality of education at a greater part depends on scientific, pedagogic personnel. On the other hand, leaders' managing competence is very important, their ability to manage not only "by eye" or precise adherence to standard documents but also certain systemic-logic attitude to various situations or problems. Often management decisions are made without having required information or this information is inaccurate, unreliable and insignificant. Elementary management problem solving algorithm is being forgotten when first of all it is necessary to formulate the problem (to name it), determine the reasons of its ori-

gin, find optimal ways to its solution and only then take on to solve it (make adequate management decisions).

Besides, it is obvious, that all successfully working leaders despite their managing style and other peculiarities are united by systemic view of any situation, ability to think in a strategic way and seek determined targets. In other words, improving the quality and effectiveness of managing is the premise for ensuring quality of general development (Baskajev, 2007).

Currently it has become rather fashionable in Lithuania to prepare strategic activity plans of educational institutions. By its essence strategic planning is a good thing because it is possible to involve a lot of people into planning activity. In this way a very important managing principle i.e. participation of the personnel in the management process is being realized. In other words, every member of the organization sees and perceives the situation in his own way. This kind of interchange of information among workers and leaders is useful. However, other not always positive things can be noticed. There are cases when a strategic plan is ordered "to be made" by a certain consultancy company or by individuals. Recently this has become peculiar to comprehensive schools. Such "artificially" constructed strategic plans in most cases are for manager's "drawer". Finally, someone earns quite solid money and sets up not a bad business. It is important to understand this because quality management broadly speaking is business as well (selection of consultants, auditors and other specialists, quality systems implementation, preparing them for certification and certification process itself). These questions, in fact, are regulated by a new international standard ISO 10019-2005 (Guidelines for the selection of quality management system and use of their services). As famous quality management specialist N.Injac (2006) emphasizes this standard introduces some kind of clarity into the whole quality management system. From the managerial point of view it is clear that mission, policy, and goals of the institution are defined by marketing researches. Just the latter practically are not carried out in comprehensive schools, very seldom are implemented in higher schools and other educational institutions. One more paradoxical thing is publicizing of strategic plans. The suggestion to "copy-paste" a strategic plan from another very similar one can be heard during various discussions. It is even being suggested to publicize the plans on the internet. However, strategic plan is a document for internal use. The question is whether, in general, it is necessary to spread it. Under the conditions of severe competition this is not only not useful but often dangerous for the institution.

Questions concerning quality of education become urgent in another aspect too. A rather intensive plundering of education market is taking place. This tendency can be noticed in many European countries. This applies to all types of educational institutions especially this question is severe in Lithuanian higher schools. Here, on the one hand, some kind of struggle is going on between universities and colleges, on the other hand, between state and private institutions. Gradually international education structures more and more actively show themselves in education market. In order to

understand all occurring phenomena you need exhaustive information. We can't assert that education institutions do not care about internal and external information. However, information gathering should not be an end in itself. First of all, we must care about facts which "hide behind the data". Moreover, it is necessary that on the basis of information we could affect processes in the direction of their improvement. So, collecting information, putting it in order, keeping, processing, storing the results and so on are very important activities when we are talking about quality management system effectively taking place in certain educational institution. Suitable and timely information is a premise for accepting optimal management decision. All mentioned activities are inevitably related to statistics. Applying of statistic methods in quality management is as a matter of fact, a priority. Speaking about comprehensive schools we can claim that there is a lack of competences in the sphere of application of statistic methods. Speaking about quality management it would be necessary to mention that standard ISO 10017:2003 regulates what statistic methods can be used in quality management. Statistic methods help to measure, describe, analyze and interpret information even having limited (not full) data. Researches show that most frequently problems arise because of educational research data processing quality, the newest research discussion, competence of the researchers to take part in one or another research (Čigienė, Lamanauskas, 2005). Another problem is baseless overestimation of importance of qualitative research methods in Lithuania. Recently it has been felt a lot. On the contrary, only referring to well-grounded methods we can give a very exact evaluation of any process condition. Education process doesn't often go on regularly or strictly according to the laws we are aware of. Randomness exists everywhere and always. Randomness is an element of objective reality. That is objective. Understanding and reducing randomness is a key to success. The features of any objects or processes always have a certain dispersion i.e. always are random. Education processes also are determined by accidental cases e.g. the repetition of teaching results depends upon students, teachers or lecturers and also upon different other parameters. The organization of education process, the microclimate of education institution always have one or another ("dispersion")-not defined accidental cases. Statistic analysis used properly allows us to distinguish accidental changes and those which are caused by concrete factors. So, in this aspect very important jobs are awaiting.

Often one can hear education theorists, practitioners and politicians claim that in different education spheres different quality guarantee conceptions exist. This also refers to quality guarantee devices. They are very different. Arguments and elementary disagreement inevitably occur among education participants on quality questions. I don't think that this should be treated as a negative thing. It is obvious that education quality is decreasing tendentiously, competition is getting stronger, education market diversification and differentiation is taking place. A need to communicate in a broader space and in more various contexts arises among education participants. One more important aspect is quality perception and guarantee in different level institutions. In

recent years there have been a lot of discussions in Lithuania about the quality of studies in higher schools (somehow the quality of education is forgotten). In the last years audit system has been started to be implemented in comprehensive schools. An ambiguous question arises again – Why only an audit system? Does audit system already mean quality management system? It is worth noting that it is perceived on the international level that without quality education in lower sections (levels) quality education in higher levels is impossible. In other words, we should speak about quality education already on a pre-school education institution level. Quality has to start from pre-school education institution and this is conceivable even in the developing countries (Tharmaseelan, 2007).

Several aspects of education quality having been discussed obviously tell us about the importance of systemic attitude. Every educational institution, first of all, has to be able to solve problems itself, look for ways out from certain situations. And this is much more complicated than in business world. In business sphere a defective product made is simply eliminated from the system and doesn't get to (shouldn't get to) consumer. In education sphere it is more complicated. It is very difficult to eliminate damage, it is almost impossible. The more, that the emphasis is transferred from external quality control system into internal in other words, institution has to be able to coordinate occurring quality management questions by inner efforts. In general, it can be asserted that any attempt to improve quality means that quality system exists no matter that it is not certified. It is very difficult to implement quality management systems in educational institutions. As it is known, education systems are rather conservative and tend to resist the implementing of innovations. Most frequently they have "we know everything" attitude. Quality management system means, first of all, that processes which are carried out in certain educational institution are managed and forecasted. I would think that duty of any head of educational institution is to seek that quality conception would become a need and virtue of every institution employee. This is a constant work. Constant efforts are necessary for this. Quality management is not a single action. This is a systemic task for the implementation of which a long term, methodical and systematic work is necessary not only for achievement of a certain quality level but for its maintenance and constant improvement.

2009
Problems of Education in the 21st Century, 12, 5-8.

PERSPECTIVE MANAGEMENT: SYSTEMIC THINKING AND VALUE SYNERGY NECESSITY

WE can surely assert that over the last two decades a very significant attention has been paid to management. It is great that more and more attention is paid to the systemic approach in management (Robinson, 1996; Jackson, 2003; Bellinger, 2004; Cyrus, 2010). It is obvious, that there are many approaches to management, for example, problem solving style, situational approach, effective steering etc. and not only to management, but also to adjacent, management related spheres. Systemic approach is reasonably considered to be as a cornerstone of management. On the one hand, this is bound by common systemic society life changes. Such topics as knowledge economy, learning society, information society and so on… are constantly accentuated. On the other hand, in some countries management as a science was basically "beyond the boundaries" of cognition. First of all, this can be said about East and Central Europe countries, in other words, still called post-soviet countries up to now. Though, the latter term is neither true nor full of sense in many respects. Not without a reason, in the public discourse of these countries the opinion is still vital that the manager is the one who is hardly able to do a thing himself. Even quite practically we can analyse a simple example. Social science field study programmes "have been in the leading position" in Lithuanian higher education for almost two decades already. It is interesting, that in many cases, fewer difficulties in studying, is pointed out as the main motive.

Rapid, quite often controversial social, economic, demographic and other changes are going on in the whole world. In many social life spheres a qualitatively different management strategy is inevitably necessary. How does it reveal itself? First of all, that win those who are able to foresee, assess the future and finally to model it. In other words, always there were and there will always be those who will work only with "burning" problems. How to find a suitable balance? There can't be all first and leaders only, can there? The role of management is undoubtedly weighty. However, world is diverse. Management science is diverse too. Generally, we can assert, that at least two management models (of the school) exist – east and West.

What is specific to some, it is not necessarily suitable for the others. The necessity of a resultful dialogue arises among various management schools at different levels – both practical and theoretical. It is necessary to share knowledge, experience and practice with others. Real practice component is a very significant one. A phenomenon, to occupy leading positions in the organisation not according to possessed managerial competences, but according to other supposed loyalty criteria is still characteristic to so-called post soviet countries. This is especially distinct in state sector. We can observe conditionally similar situations in the educational sector as well, especially in higher education. Isn't it paradoxical, that management knowledge is conveyed to students by the lecturers who themselves have never taken part in the real management process, not having managerial practice and so on.

The aim of this editorial is not to discuss modern management problems. We seek to draw everybody's attention only to several aspects. Management theory and practice cannot be separated from other cognition and activity spheres. The manager acting effectively is not only a good expert in management theories and natural phenomena. It is necessary for him to have proper psychology, sociology and other field knowledge. The management component of value becomes even more important. Various economic crises which from time to time are rolling through the world quite often are determined not by economic-managerial phenomena, but by a so-called human factor. This factor quite often reveals itself in the selfishness of certain groups of people, dishonesty, irresponsibility and so on. Thus, possessed managerial experience and abilities do not conform to essential managerial ethics requirements. Moreover, we should talk about social responsibility of the leaders in a wider context. The basis of it is just formed of possessed values – in general sense, human's convictions about "what is good and what is bad". We can orientate into the maximum profit of the organisation, not overstepping (and very often on the contrary) legal limits. However, one can behave otherwise – try to coordinate the attempt for profit with altruism. This is a complex, many efforts requiring job. So far, not every manager is able to go along that road and orientate their team into this. Why? First of all, we can think so, because traditional leadership doesn't suit here, traditional perception of it. The future leader is not the one who only ensures sufficient organisation activity efficiency or achieves good financial indicators. The leader is the one who has in himself creative, paradoxical or even risky approaches and is able to show them to others. This is, in fact, another level of leadership. Individual leader's status or personal charismas are not the essential leadership components. A more global, dynamic, softer leadership perception is necessary.

We can agree with Gary Hamel (2007), that today more than ever, organisations need brave management innovations. Modern management model orientated to control and productivity doesn't suit in the world where business success is determined by adjustment and creativity. Thus, it is believed that discussions on these mentioned and not mentioned management questions will go on in these journal

pages. One thing is obvious, that values become one of the most significant and perspective instruments of management effectiveness and optimisation. Value institutionalisation in the organisations is one of the most important guarantors of their effective activity.

2011
Problems of Management in the 21st Century, 1, 5-6.

THE QUALITY OF STUDIES: MANAGEMENT ASPECT

IN recent years attention to quality of studies is not decreasing. Lots of different level and type articles have been written, books and other literature have been published. On the other hand, over the last few years different national, regional and international science conferences and symposiums took place. Some of them can be mentioned. In November, 2000, "International Conference on Quality Assurance in Higher Education: Standards, Mechanisms and Mutual Recognition" took place in Thailand. One of the main accents in this conference was the question on how to establish new mechanisms of quality assurance and quality improvement (Harman, 2000). In October, 2010, an international conference took place on Quality Assurance in Higher Education in Africa: Setting a Sustainable Agenda for a New Decade (http://www.unesco-bamako.org/conferences/). In February, 2001, 10th International Research Conference on Quality, Innovation & Knowledge Management (http://www.buseco.monash.edu.au/mgt/qik-conference/) took place in Malaysia. There's no purpose in mentioning all conferences that were held. All of them were significant in their own way. After all, different events on university study quality questions are regularly organised by international organisations such as, for example, European University association (http://www.eua.be/Home.aspx). One of the mottos of EUA organisation is – strong universities for Europe. So, it is obvious, that the concern in the university study quality is really huge. However, the essence of the matter lies somewhere deeper. The main goals, formulated in Bologna declaration, had to be implemented by 2010. However, now it becomes clear, that some of the vitally important things were not realised and there are more and more doubts if they will, on the whole, be carried through. The Bologna process itself is not sought to be analysed. What interests us firstly, is the quality of studies' management question. Various researches reveal that the university study quality in some countries has significantly decreased even measuring according to the most minimal criteria. First of all, this is because most universities are oriented into providing service. It is known, that service University is not capable to ensure the proper quality of the studies and of provided education at the same time. Mass univer-

sities meant for mass usage. University education is more and more "Mc.Donaldized" (Lamanauskas, 2011a).

Going back to Bologna process, it is worth to notice that the question of quality in the mentioned declaration is not the basic. In the declaration it is said, that Bologna process members' cooperation is important seeking to evaluate the quality on the basis of inter-comparative criteria and methods. During the period after the announcement of Bologna declaration, negative, opposing ideas were in fact, getting stronger as well. It is natural in this sense, that every country is peculiar, social-cultural and political-economical context of the countries is rather distinctive. In such different contexts, complex functional links and various patterns exist. It is likely, that this is one of the reasons why Bologna process was not going and is not going so as it was believed. Both students and teachers regularly, in different forms express dissatisfaction with the current situation. For example, a new law on science and studies came into force in Lithuania as far back as 2009. A new study fee system – student's basket - was legitimated. In other words, students, entering state higher schools, having received state financing, so-called "study basket", don't have to pay any other fees related with the studies. In Lithuania, in 2009, about 21thousand of freshmen were admitted to study in the places financed by the state: 11 thousand –to universities, 10 thousand – to colleges. In the later years political attitudes were changing. The number of financed places at state universities is consecutively diminishing. It is paradoxical, however, in the preamble of a new mentioned law it is written that "The mission of science and studies is to help assure the prosperity of the country society, culture and economy" http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=343430&p_query=&p_tr2=).

However, it is impossible to implement such mission without strengthening universities in all possible ways, and not devoting proper attention to them. It is urgent not only to Lithuania but to smaller European states as well. For the universities of such countries it is difficult indeed to survive in global and aggressive market, where quite often money determines everything. It can be stated, that quite often some universities complete the number of students not according to their knowledge and abilities, but according to their financial power. Thus, the student who brings money to university is expected. And it doesn't matter in what form –whether it is study basket or any other. The most important is to survive in market. Thus, in this respect study quality becomes a subject of minor importance. It is clearly understandable, that study quality directly depends on science quality. The studies have to be based on the newest science achievements. Unfortunately, in many cases there is not so. Universities become very ordinary schools where relatively not bad teachers work, conveying the truths of the textbooks. Free attitude to studies, free attendance of the lectures, orientation only to student needs (sometimes pseudo needs) almost don't leave place for fundamentality, which is the basis of good education. The duration of studies is being diminished, claiming that education can be acquired during the shorter time. And where are these limits of cleverness and rationality? This is management question. One of the aspects

is study quality mythologization. In some European countries, especially in post-soviet ones, a stereotypical thinking is still vital, isn't it? This reveals itself in different ways. Study programmes are assessed, old study programmes are re-written, naming it improvement, different self-appraisals and reports are arranged, development is imitated and so on. On the other hand, it can be seen, that practically funds are not allotted for raising teachers and scientists' qualification, for the renewal of scientific research base (equipment, laboratories and other). Students also very often choose higher education only for diploma; they are not motivated to seek professional development. A lot of examples could be presented, however this is not the aim of this article. It is obvious, that a rather wide disparity remains between modern declarations and current practice. The lack of systemic thinking in higher education management sphere is not only real, but it becomes even dangerous (Lamanauskas, 2011b).

The other aspect is risk management in higher education. The quality of studies can't be analysed separately from all university and other processes taking part in it. The quality of conditions, processes and results is a universal very resiliently related triad. In other words, university work is specific in many respects and here classical risk management patterns quite often don't suit or don't function properly. For example, rather often employers complain that contemporary university preparation is not proper, that young people, having finished universities, hardly adapt themselves in the labour market, preparation is very theoretical, so enterprises and other organisations are made to re-teach specialists in their working place. For this, undoubtedly, extra investments are necessary. This is one of the risks for a concrete enterprise fail to achieve necessary productivity due to insufficient qualification of the workers. University education importance can be discussed in many ways however the fact is obvious, that universities are still estranged from today's labour market. Here is one example. Let's say, in recent years quite a lot of lawyers have been trained in Lithuania. Law study programmes are almost in all universities and in some colleges. However, when more serious judicial problems arise, government looks for law specialists behind the boundaries of the country. This tendency is observed not only in Lithuania, but in some other European countries as well. Without doubt, there are a lot of other risks. Therefore, it is important, that risk management ensuring the quality of studies remains very urgent.

Thus, good higher education is really very expensive and is hardly achievable. It is paradoxical, that it is less and less valued. The power of "attraction" between universities and employers is changed by the power of "repulsion". The latter is getting stronger and stronger. How to reduce this always growing distance between two sides? How to escape the produce of "fault" for always growing price? Good examples occur. How to coordinate very different interests of the employers? Quite often universities are blamed for preparing the youth too academic, "bookish", almost not having any practice. The middle and small business sectors need people, having bigger practical experience, after all, such employers are content with the cheaper working force. On

the contrary, large business representatives require high qualification workers with big theoretical and creative power, capable to create (generate) and realise ideas.

Thus, the problem of the quality of studies remains the key problem in nowadays university work. It is understandable, that different countries have different experience in this field both in horizontal and vertical sense. The quality of studies conception despite all efforts remains diverse and has multiple meanings. Paraphrasing a familiar soviet times' statement ("from everyone - according to possibilities, for everyone – according to demands"),one can state, that higher education can't be provided according to demands, and it can't be required from graduates according to their abilities and possibilities. Massification of higher education in a direct way negatively affects the quality of studies (process), as well as higher education quality (result). This is the essential risk in university management.

2011
Problems of Management in the 21st Century, 2, 5-7.

RESPONSIBILITY FOR MANAGEMENT

BUSINESS is neither a new branch of science, nor a recently emerged social or political phenomenon. We are not tend to discuss the history of management as obviously this field like many other activities stimulated by human includes own origin, gained experience and a certain retrospective. A modern world has strongly developed the concept of management thus becoming an integral and manifold idea. A number of published articles, text/books, recommendations, etc. represent different levels of writing. Moreover, corrections and supplements are made to the already available management theories and conceptions the new versions of which are also successfully created. The present structure of studies at university can be hardly imagined without varying courses on the subjects related to management. For the last two decades, the majority of countries around the world have faced the young generation engaged in management sciences; after graduating secondary school, a relatively large part of the youth keep on studying management sciences, i.e. a strong tendency reveals that graduates prefer social sciences and humanities. The reasons for motivation may vary. However, more frequently expressed opinions are those stating that such choice can be simply influenced by laziness experienced by a part of students, willingness to try, overcome difficulties, etc. Despite a notable lack of professionals in the field in technological sciences in a large part of countries, quite a few learners are greatly interested in social sciences. Supposedly, such choice can be the result of the existing stereotypes and rational motivation (less complicated entry to a university, easier studies, etc.). Lengthy discussions are inappropriate due to the fact that in-depth research on dominant motifs is required. This is important because today's young people are would-be leaders and managers and the degree of their motivation, purposeful choice and responsibility will affect not only the well-being of a certain organization but also that of particular society.

The factor in responsibility considering the structure of management should gain the required weight. The success of organizations is determined not only by a properly prepared strategy (frequently in a 'paper version'), optimal structure, precise-

ly and effectively organized processes, but also taking into account the responsibility of particular people at various levels of management. Nevertheless, the above introduced issues are not paid enough attention – a more common option is considering the questions of management at the level of organizations. Meanwhile, a discussion on responsibility, first of all, must evaluate the competencies of a one or another manager. In a complete scale of managing competencies, responsibility should serve as an integrating and effective element. The worldwide known Japanese manager Kazuo Inamori (2006) stated that 'to be the right man, he was striving for things appropriate for everyone'. It seems to be clear there are opposing positions pointing to different theories investigating the phenomenon and expression of responsibility in management. Perhaps modern rather than useful concepts of social responsibility should be mentioned, which has become especially noticeable for the last few years. Plenty of enterprises and organizations find themselves socially responsible thus discussing and making such information publically available. Moreover, the main argument put forward by such organizations suggests this is the way of how they are involved in the development of sustainable society. From a systemic point of view, all theories, concepts, laws, etc. are formed and described in scientific writings, and, as a rule, are only valid for ideal systems under ideal circumstances. However, reality is different, and therefore real systems considerably differ from the ideal ones. Next, the majority of theories and laws are logically cannot be applied for such systems, particularly for those designed for management purposes. These can include not only non-linear systems, but also heterogeneous, multi-criteria, multi-parametrical, etc. What is the degree of the social responsibility of enterprises and organizations for the actions taken if they are primarily focused on expressing the interests of the clients and/or shareholders? We cannot accept responsibility as such due to the fact that profit-chasing by any means frequently becomes the action of priority.

Thus, management becomes more up-to-date and faces a crisis that sparks off increased pace at work, different pressure, hardly understandable orders, stress and even suicides at the workplace. Although recently these issues are frequently discussed, still, it is not sufficient. Some of the methods for management are frequently accepted as making a negative impact on the physical and psychological state of the employees despite the fact that they appear to be efficient tools in terms of increased profit. Only discussions cannot solve this problem, which clearly indicates a lack of in-depth and reliable scientific research in the field.

Responsibility is obviously directly related to values. Various crises of economy frequently arising in different parts of the world are often determined by the consistent patterns of managerial economics and the so-called human factor (Lamanauskas, 2011). Management is not unfettered freedom to generate profit or other material resources taking advantage of other people. According to C. Dierksmeier (2011), more and more frequently we discuss about the constructive use of the idea of responsible freedom. Certainly, a good manager is the one who has a broad knowledge of manage-

ment theories and demonstrates practical abilities and skills. A gift of speech, pleasant appearance, good manners of behaviour and finally information on the nuances of management ethics are not enough. Traditionally, work done by a manager is complex and highly responsible and can be carried out by the one who has gained the required amount of knowledge and skills at management. It is reasonable to admit that the field of management can (should) only be properly acknowledged by those having a high level of responsibility perceived as one of fundamental values. Knowledge about and skills at management can be successfully acquired. Hence, the saying that *'a good manager is worth a golden bar'* really makes sense.

2012
Problems of Management in the 21st Century, 5, 4-5.

SOME FEATURES OF EDUCATION MONITORING

EDUCATION monitoring is quite a fresh field of the science of education, especially in Lithuania. This field is closely interrelated with methodology of educational research, education politics, education management, education economics, etc.

The term "*monitoring*" has recently been introduced. It was first used by naturalists. This term was used in 1972 at a United Nations conference on environmental issues (in Stockholm).

The term "*monitoring*" can be understood in diverse manners. Monitoring is defined as precise observation, as a precise scientific investigation and verification aiming at collecting certain information (The American Heritage Dictionary; cit. Cotton, 1988). Self-monitoring has also been widely discussed. Scientific literature indicates that M. Snyder was the first who used the term "monitoring" in 1974. Education monitoring has been investigated from different angles; much attention has been paid to the problem of quality of education in relation to monitoring. Education qualimetry (*qualimetry* is the sum of methods of quantitative evaluation of qualitative indexes, theory of the evaluation) has been increasingly developed. Obviously, the purpose of monitoring is to analyse the efficiency of a certain system of education or any of its subsystems. Indeed, despite normal functioning of the whole system of education its separate subsystems might malfunction seriously. On the other hand, it is unfair if problems of education monitoring are focused exclusively on qualitative education monitoring. Being conscious of the importance of quality of education in the context of European Union expansion we shouldn't leave aside other significant spheres of education (e.g. monitoring of the development of students' general abilities), without cohesive functioning of which it would be impossible to ensure quality of education. On the grounds of different opinions we assert that *education monitoring* is the system of collecting, processing, storing and disseminating information about the system of education or its components, oriented towards informational provision of education administration, which allows judging the condition of the system at any time and forecasting development of the system.

The elementary operation of monitoring process is measurement. There are qualitative and quantitative measurements. From the methodological point of view it is essential to understand the object of monitoring, its structure and interrelations, and fundamental processes etc. The most important characteristics of monitoring are the following:

- Organization;
- Accuracy;
- Dynamism;
- Continuity;
- Singleness (the aspect of forecasting).

The object of monitoring determines the choice of monitoring methods. Obviously, objects of monitoring vary among educational institutions of different level and type.

Various kinds of monitoring can be distinguished. Monitoring systems can be distinguished according to the sphere of application, means of implementation, purpose, means of collecting information, objectives, the aspect of comparison, users and intensity of using the products etc.

The process of monitoring raises a significant problem – how to ensure high quality of instrumentation used in measurement, precise criteria of evaluation, relevant indexes and indicators, quality of the process of measurement, quality of statistical processing of data and its adequate interpretation. Consequently it becomes clear that training of education monitoring specialists is a task of prime concern.

Distinctive monitoring systems exist in many countries. Usually our knowledge about them is only fragmentary. We can state that local monitoring systems are most widely developed. Obviously, most countries, including Lithuania, are interested in effective functioning of their systems of education: minimal expenditure, maximal results. As we have already mentioned, education monitoring is one of the most important instruments. It also includes *an audit* of schools. Analyzing Lithuanian experience of the educational reform it is evident that education monitoring was hardly ever discussed from 1990 until 2000. Problems of monitoring became a talking point after 2000.

Global tendencies, international competition, the intellectual potential of the country – these concepts are encountered very often. Education monitoring is as a central pivot which links together different problems in Lithuania. Obviously, only an educated nation is able to survive international competition and other international problems. The issue of education quality should be approached from different angles – elite and mass education, formal and informal education, state and private, democratic and liberal education, even "shadow" education. It all has to do with education quality. It is necessary to establish an efficient system of qualitative education monitoring. Evidently, monitoring of quality of education is the instrument which reveals a current situation and provides with findings and recommendations concerning improvements

in quality. Education quality monitoring can be described as a systematic and persistent procedure of collecting information on the most relevant issues of education. Education quality monitoring must be carried out systematically.

The value of monitoring is also a very important approach. The value of monitoring is significant on an international scale. Provided with comprehensive information about the situation of a certain system of education one could easily compare it to other systems, carry out forecasting, and shape possible perspectives of development.

Monitoring can be perceived as a complicated phenomenon in making, characteristic of interdisciplinarity (integrity). Monitoring can be analyzed as an *informational, diagnostic, scientific, prognostic* etc system which is most usually implemented in the context of process administration. The effective realization of the monitoring process requires adequate managerial skills.

The connection between educational diagnostics and education monitoring is evident. Before we carry out monitoring at a certain level of the system of education we must have relevant instruments for collecting, processing information and the like. Monitoring results are influenced by such substantial factors as quality of instruments, mastery of specialists, social peculiarities of the groups under investigation, lapses in the stream of information, divergent motivation of monitoring participants, statistical regression and many others. All these factors can show themselves jointly, in different combinations, compensate one another etc. Some of them are controlled and in most cases depend on the qualifications of monitoring specialists, for example, quality of instruments, mastery etc. Awareness and evaluation of these factors reduce the risk of obtaining overweighted results.

The *essence of monitoring* is consistent diagnostics of in-system processes, when different necessary measurements are carried out in order to get information about development (succession of condition) of the system under investigation (Lamanauskas, 2004). Timely corrections in the progress of educational changes help to avoid gross mistakes and undesirable subsequences.

2012
Problems of Management in the 21st Century, 4, 4-6.

UNIVERSITY MANAGEMENT: A FEW PROBLEMATIC THINGS

UNIVERSITY activity and effective functioning is the object of constant discussions. This is taking place in all countries, having university education sector. It is understandable, that the context of every country is different, having individual traits and peculiarities. Lithuania is not an exception. The country's higher education system experiences serious challenges, which are caused both by local socioeconomic changes and international global matters. Labour market dynamism and the changing society require flexible, innovative and creative lifelong learning possibilities. Higher education institutions do not limit themselves with basic specialist preparation, but search possibilities for the specialists and professionals to improve, change their specializations, train their personal abilities and develop high level professional competencies. Thus, continuing teaching (studies) at universities becomes more and more urgent.

It is not sought here to analyse deep, strategic things of university management, but just to draw attention to a few problematic things on the basis of Lithuanian experience and context. Some moments are likely to be urgent not only for Lithuanian universities.

As it is known, for a long time Lithuanian higher education system has been managed "from the top", i.e., by central government. In the Soviet times, the main standard documents used to be prepared centrally, all higher education institutions used to follow the same plans and regulations. On the other hand, trying to achieve higher education was important, seeking to assure a certain position in society. Of course, there used to exist a strict so-called professional orientation system (today fashionably called career designing or career planning), which used to select the pupils. Those, who were doing worse in learning, the pupils of lower abilities, used to be oriented to vocational schools. Over several decades, a rather negative opinion formed about vocational schools. After 1990, having re-established Lithuanian independence, Lithuanian higher education system experienced transformation. It needs to be said, that changes of this system were going the slowest. General education sector was being reformed much faster. Higher education system was changing very slowly. On the

other hand, administrative restrictions having not remained, plenty of pretenders, seeking to acquire a higher education diploma, gushed to universities. Over the last 20th century decade, the universities were functioning quite well; big threats were not seen or were not wished to be seen. It was the action of inertia. In fact, Lithuanian universities were developing extensively – the number of students was increasing, there were quite enough of activities, the number of payable places at universities was also rapidly growing. Non budgetary financing of many universities reached almost 50 percent. However, imperceptibly the other tendencies became apparent as well. Professional education sector was changing rapidly. Lithuania allocated big financial resources to change vocational school activity in essence. Meanwhile, the universities began to feel the shortage of students. A great number of factors had an influence on this: big emigration, possibilities to study in foreign country universities, international higher education market participant pressure and so on. Finally, in different ways, the attitude was getting stronger in society, that only abroad one can acquire quality higher education. Since 2000, the universities consequently started to decrease. To be more precise, the number of the studying has been significantly and purposefully diminishing. One of the goals to keep students and to attract them is the new study programmes. On the one hand, it is a positive thing, seeking to renew oneself, to maintain a proper university level. However, an opposite effect functions here as well. Especially it is distinct in the field of social and humanitarian sciences. Not necessary, in fact, prospectless, but very similar study programmes, having very "high sounding" titles have been started "to cobble", e.g., public administration, personnel management, children's rights pedagogy, sustainable society development and so on. Thus, it is not surprising, that both in the institution and in government layers opinions appeared about the abundance of study programmes. Finally, study programmes became similar in all universities, in fact, because they simply used to be copied and transferred into other institutions after not a big "curricular make –up". However, it is quite understandable, that new study programmes can and have to be created only on the basis of scientific researches and personal competencies. Market demands are not rejected, but are adequately analysed, evaluated and predicted. Simultaneously, active scientific research work, teachers' professional competence development and improvement should take place.

What to do? You can study management at any Lithuanian university. At technological profile university one can study pedagogy, at a health science university – veterinary and so on. An opinion and an aim were getting stronger in government layers to minimize the number of study programmes, because universities are rapidly loosing their authenticity, specificity. Even such a term appeared as study programme profitableness. It is being measured not according to the specialists' demand or other important indicators, but simply according to students' number and more exactly, according to drawn money amount – it doesn't matter if it is personal or state. Simple business and that's all. No money, no students; scientific pedagogical personnel isn't necessary either. It is simply being diminished, instead of directing the most produc-

tive teachers into scientific research activity, making for them better conditions to develop scientific researches. Nobody wants to hear about the law of saving the main personnel under crisis conditions. Perhaps such logics is effective in business organizations, however, for universities it doesn't suit. Scientific pedagogical personnel is being formed for a long time. Special competencies are necessary for this, generation continuity. It's a pity, however, in the latter years Lithuanian universities lose their best specialists because of improper managing strategy. Being satisfied with the lowest qualification personnel is a much more dangerous thing. It was already discussed about this (Lamanauskas, 2011).

Side by side there exists a study programme quality evaluation question. On the one hand, it is necessary to evaluate study programme quality. On the other hand, Lithuania is a special country, from this point of view. We are able to adapt ourselves and not necessarily in the most positive meaning. The process is rather simple. International expert group is formed, which evaluates study programme self-analysis, prepared by teacher teams. It is known, that self analysis is a good thing in this meaning, that it allows ourselves to discern relevant problems and to search the ways for solving them. Such an intention cannot be valued in a negative way. Beside various procedure things, responsibility factor becomes the most important. Not only perfectly prepared strategies (very often "paper"), optimal structures, exactly organised and effectively carried out processes determine organizations' activity success, but also concrete people – various level managers' – responsibility (Lamanauskas, 2012). Moreover, all employees should play active roles and participate in managing the company (Inamori, 2012). Thus, practice is very often opposite. Self-analyses are prepared in the way the experts would like them to be, i.e., they, in fact, do not reflect the real situation. To tell the truth, the experts succeed in noticing and fixing some things, however, this, in fact, does not change the situation. The programme is accredited for a certain period and then it is checked again or it is just written the new one with the new title. As it is known, such situation is only maintaining the status, self-deceiving, thinking that everything is alright. However, the essence of self-analysis is to find what is not good, to find the effective ways to change, to implement new changes. From managerial point of view, this field requires exceptional attention.

And the last moment which requires more exhaustive analysis. In Lithuania a tendency is observed, that it is more worth to acquire higher education diploma because of personal prestige than evaluating its real demand. It is not surprising, that after graduating from universities, not a small part of young people continue their studies in vocational schools. They simply seek to acquire a real, marketable profession, just to learn a certain trade. How to value such a situation? Is it normal, that a person, having graduated from a university, cannot find a job, he is practically not desirable in the market. One can think that higher education just gives flexibility to a man, a wider and deeper attitude. On the other hand, what are the studies at university worth, if one has to inevitably go back to vocational school in order to obtain the profession which could

allow consolidating one's position in the market? The question is rhetorical, important, urgent. Is such a tendency observed in other countries? What managerial solutions are necessary here? How should the universities change?

It is obvious, that competence is getting stronger between universities – both at the national and international levels. Blind orientation only to a consumer (a student), only to providing service to him, weakens the quality of the studies and of the acquired education as well.

2014
Problems of Management in the 21st Century, 9 (1), 5-7.

REFERENCES

Baskaev, R. M. (2007). Ot povyshenija kachestva i jeffektivnosti upravlenija k povysheniju kachestva obshhego obrazovanija [From improving the quality and efficiency of management to improving the quality of general education]. *Upravlenie kachestvom obrazovanija: teorija i praktika jeffektivnogo administrirovanija*, *1*, 3-8.

Bellinger, G. (2004). *Management & Leadership: A Systemic Perspective*. Retrieved from http://www.systems-thinking.org/malasp/malasp.htm (accessed on 03/06/2011).

Čigienė, R., Lamanauskas, V. (2005). Edukaciniai tyrimai bendrojo lavinimo mokykloje: situacijos analizė [Educational research in comprehensive school: Analysis of the situation]. *Mokytojų ugdymas / Teacher Education*, *5*, 115-121.

Cotton, K. (1988). *Monitoring student learning in the classroom*. Portland, OR: Northwest Regional Educational Laboratory.

Cyrus, A. (2010). A systemic approach to human resources management. *Advances in Management*, *3* (5), 16-19.

Dierksmeier, C. (2011). The freedom-responsibility nexus in management philosophy and business ethics. *Journal of Business Ethics*, *101* (2), 263-283.

Hamel, G. (2007). *The future of management.* Harvard: Harvard business school press.

Harman, G. (Ed.) (2000). *Proceedings of the international conference on quality assurance in higher education: Standards, mechanisms and mutual recognition* (Bangkok, Thailand 8-10 November 2000). Bangkok. Available on the internet: http://unesdoc.unesco.org/images/0012/001278/127860e.pdf (Retrieved 22/112011).

Inamori, K. (2006). *Gyvenimo filosofija* [Philosophy of life]. Vilnius.

Inamori, K. (2012). *Amoeba management: The dynamic management system for rapid market response.* New York: Productivity Press.

Injac, N. (2006). Kak vybrat' vneshnego konsul'tanta [How to choose an external consultant]. *Vestnik Akademii Pastuhova*, *1*, 16-17.

Jackson, M. C. (2003). *Creative holism for managers*. Kluwer/Plenum, London.

Lamanauskas V. (2007). Studijų kokybės miražai [Studies quality mirages]. *Lietuvos Aidas*, *208*, 1, 3.

Lamanauskas, V. (2004). *Švietimo monitoringo įvadas* [Introduction to monitoring of education]. Šiauliai: Lucilijus.

Lamanauskas, V. (2011). “Makdonaldinis” išsilavinimas: greitai, pigiai ir lengvai, bet neefektyviai [“McDonaldized” education: in a fast, cheap and easy way, but ineffectively]. *Švietimas: politika, vadyba, kokybė / Education Policy, Management and Quality*, *2* (8), 4-10.

Lamanauskas, V. (2011a). The ”McDonald‘s-ization“ of education: Search for fast results. *Problems of Education in the 21st Century*, *34*, 5-8.

Lamanauskas, V. (2011b). Perspective management: Systemic thinking and value synergy necessity. *Problems of Management in the 21st Century*, *1*, 5-6.

Lamanauskas, V. (2012). Responsibility for management. *Problems of Management in the 21st Century*, *5*, 4-5.

Robinson, W. W. (1996). A systems approach to management. *Engineering Management Journal*, *6* (4), 172-176.

Snyder, M. (1974). Self-monitoring of expressive behavior. *Journal of Personality and Social Psychology*, *30*, 526-537.

Tharmaseelan, N. (2007). Tertiary education in Sri Lanka: Issues and challenges. *Bulgarian Journal of Science and Education Policy*, *1* (1), 173-190.

EDUCATION QUALITY

HIGH-QUALITY EDUCATION AS KEY FACTOR FOR SUCCESS IN A KNOWLEDGE-BASED SOCIETY

THE advance of IT has never been as rapid as nowadays. The influence of globalization on ICT expansion is incontestable. However, it is a tremendous challenge to education. The implementation of technologies in education does not mean that they will have only positive influence. For that purpose consistent educational, ergonomic, valeological and other research is necessary, constantly giving information not only to users, but also to ICT producers. We can assert that in Lithuania, as well as in other Central and East European countries, observation of ICT application in education is still carried out episodically. As it was already mentioned, the process of ICT development is so rapid and so socially important that monitoring technologies, having earlier been created in other countries (especially West European), eventually occur to be not full and not compatible with ever changing realities. Thus, as a matter of fact, it is impossible to prepare standard, constant methodology.

In Lisbon strategy 2000, it was foreseen to seek that Europe would become the most competitive knowledge-based economics in the world. No doubt, to achieve this aim, ICT influence really should be great. Such international organizations as IEA (International Association for the Evaluation of Educational Achievement), UNESCO, OECD (Organization for Economic Cooperation and Development) organized fairly comprehensive research in the application of ICT in educational system. Organizations such as: IOSTE (International organization for Science and Technology Education), ICASE (International Council of Association for Science Education) and other so called professional different sphere scientist organizations are interested in the above –mentioned problems.

The application of ICT in comprehensive schools as well as in higher educational establishments is, undoubtedly, a positive thing. According to I. Mažulienė (2002), the usage of ICT makes the pedagogues change their settled style of work, raise qualification, develop skills and plan differently their and children's activities. On the other hand, the aims of creating information society change inner and outer surroundings of schools, therefore information processes and technologies acquire

greater and greater significance in modern educational organizations. In addition, interesting research was carried out by specialists from Information Institute in Germany (Munich University). (Woessmann, 2005). The research showed that computers can harm the learning process. It is claimed, that the number of computers at school and the time spent at the computer at home don't confirm the fact that children learn much more by using IT. The importance of IT in the process of learning is not denied, however, it is stated that those who are using IT at home and at school moderately, besides, the time of its usage is limited, achieve better results than those who spend too much time at the computer.

However, not only in comprehensive schools some or the other of the ICT application problems arise. One of the biggest problems the majority of universities face is passing from ICT integration and e-learning in the project level onto strategic level when all technologies are implemented all over the institution. The research shows that in EU universities general level of ICT integration into teaching process has increased over the last few years. Nevertheless, application of ICT is still perceived as the usage of computer in traditional pedagogy and didactics. Not many universities use ICT equipment according to principles of innovative didactics and pedagogy. The same can also be said about Lithuanian universities.

Speaking about general education sector it is necessary to acknowledge that application of ICT depends not only on teacher's qualification and his preparation to use ICT in the teaching and learning process. The essential questions are as follows: how much does the school administration support the implementation and usage of ICT at school?; What ICT infrastructure (equipment, software, Internet connection and so on) is available at school?; What services connected with ICT do exist for the staff improvement and support?; How much do the schools apply the aims and the way of work emphasizing independent learning, and so on.

Thus, it is obvious that vast, comprehensive, detailed research in the appliance of ICT in education process is necessary. In the Software & Information Industry Association report of the year 2000 it is stated that so far more than 3500 research studies of ICT application in education process have been carried out, the majority of which are devoted to analysis of infrastructure and computer literacy situation. However, statistics of the latest research studies doesn't allow to discern some ICT application aspects. Not only strict statistic data analysis is necessary discussing specific questions of ICT application in education, but also a deeper qualitative approach to this phenomenon in order to perceive present situation, its advantages and disadvantages and also further perspective not only on Lithuanian but also on EU scale.

As a matter of fact, harmonious ICT integration into the teaching process is placed in the centre of all European country strategies, in this way trying to significantly improve teaching and learning in order to correspond to children's demands. The secondary becomes earlier dominated task of computer equipment supply and teaching about technologies. (Simonson, Thomson, 1990; Plomp, 1996; Sendova, 1994). ICT

service development in different education spheres prevails in the European Union and other country strategic directions. .

A very special attention is devoted to natural sciences and to technological children and youth education. About the concern in this sphere tells one of the newest prepared documents (Science Education Now…, 2007). Constantly going down natural science and technological literacy of our society is noticed in many countries (Lamanauskas, 2003). Opposite and significant tendencies in this sphere were discovered by ROSE research (http://www.ils.uio.no/english/rose/). In this publication the reader will find urgent articles on this subject. Up-to-date ICT application in natural sciences and technological education is developed most rapidly.

It is obvious that the implementation of new technologies in the educational process raises new possibilities for both teacher and learner, enhances education quality and makes the educational process itself more versatile. However, education quality still remains insufficient as the content of education and studies is poorly oriented towards developing the new abilities and competencies necessary for people living in an open public society and market conditions. The economy based on information becomes a priority in the European countries. It should be noticed that the reality of an open public society and market conditions is not and cannot be ideal and that qualitative education has to help people not only to accept this reality but also to critically evaluate and advance it. In this case, the most important point is that human must preserve his/her identity, self-sufficiency and to strive for a purport of life. Any action such as the improvement of the education system or implementation of new technologies must be carefully studied and firmly fixed. All possible outcomes, results and impact not only on a further but also on individual development of a young personality must be evaluated (Lamanauskas, Vilkonis, Klangauskas, 2007).

We should carefully analyse different and sometimes very complicated teaching and learning phenomena, we should develop interdisciplinary, methodological thinking and action. Only such thinking and action approach has decisive significance towards education quality.

2008
Problems of Education in the 21st Century, 3, 5-6.

QUALITY OF HIGHER EDUCATION: IDEALS AND REALITY

THE recently discussed issues of education quality are devoted full attention. The systems of quality control are developed, services are certified etc. All EU countries point to education quality as one of the most important political priorities. Despite the fact it is an excellent idea, the questions of how to ensure adequate education and how to achieve equally ranked education certification in all countries of the European Union arise. From the perspective of Lithuania, it is essential that university education gained at national level should be internationally accepted. Therefore, different legal and political documents approved by Lithuanian authorities in one way or another emphasize that ensuring quality education is a priority field.

Yet in the last decades of the past century, the universities worldwide closely focused not only on the quality of studies but also on the other services provided by modern universities. Every country of the European Union owns certain structures concentrating on the above introduced problems. For example, Quality Assurance Agency for Higher Education was established in Great Britain in 1997. The Netherlands has two organizations - Association of Universities and Association of Universities of Professional Education. Finnish Higher Education Evaluation Council looks at the situation in Finland etc. In this case, Lithuania is not an exception as since 1995, this field has been maintained by the Centre Quality Assessment in Higher Education (CQAHE). This organization implements the external quality assurance policy in research and higher education in Lithuania and contributes to the development of human resources by creation of enabling conditions for free movement of persons (http://www.skvc.lt/en/?id=0).

In regard to university life, it can be firmly stated that the problems of studying quality are given scrupulous attention. An apparent focus entirely on ensuring the quality of studies can be noticed in Lithuania. The classical principle of unity of science and studies cannot be considered as a suitable solution. The quality of studies and the process of studying are integrated and therefore determinine one another (Lamanauskas, 2007). Finally, the world practice shows that the concepts of quality management

are developed in at least four major fields including the processes of studies and scientific research, administration, designing curricula of studies and teacher training. The central point is the understanding that quality cannot be bought in the market and is not something beyond institution boundaries. Everything will be determined by awareness that quality in a broad sense is conditioned by the quality of management (administration). Only professional management leads to qualified processes (institution work) whereas the latter ensure high-quality service. Otherwise, we can face a situation frequently encountered in the system of Lithuanian higher eduction. For example, after regaining independence, Lithuania suffered from lack of managers and lawyers, and thus national universities started implementation of the required curricula of studies. Presently, all universities in Lithuania train would-be managers. However, the problem is that the quantity of professionally prepared experts in the field is decreasing while at the same time, a total number of professional managers is increasing. Similar problems can be observed in a number of Europen countries.

As the understanding of quality may vary, a general agreement on the issue discussing quality is very important at least inside the institution. Quality is differently treated by academic staff, students, employers, social partners of institution, authorities and society in general. No special investigation is necessary in order to find out that the position of Lithuanian society on the quality of higher education and studies is not favourable enough. During the last decade, a number of young and gifted Lithuanian people have entered the universities and started working in the neighbouring countries. The process has been given a sound name *Brain Drain*. A free people's movement in the open world should be a natural process. However, the careless government's position on the analogous situations in some countries seems to be a surprise. When the situation becomes really complicated, the programmes aimed at 'recovering losses' are created. Nevertheless, similar measures can hardly be sufficient for making a substantial impact. Thus, the Overseas Lithuanians' Support Centre is responsible for running the project *Design and Implementation of Brain Drain Programme* the purpose of which is creating a programme for Lithuanian people studying and working in the foreign scientific centres. The programme encourages Lithuanian citizens moving back and implements a competitive financial mechanism that will be applied for arranging scientists' visits to Lithuania. A serious problem is that up to now, no official statistics on the degree of graduent students, scientists and other researchers' emigration from Lithuania has been prepared. Moreover, there is lack of information on national scientific research and available vacancies in the institutions of science and education. Frequent discussions under a negative shade lead to appropriate society's reaction.

It seems, not much is required in order the quality of higher education should become more outstanding and satisfy not only personal needs but also the requirements imposed by a certain country. However, increased financial support (which is a very important factor) cannot change the existing situation. Education is a complex system having different levels, sub-systems etc. that closely correlate and determine

one another. It should be stated that training of secondary comprehensive school graduates is still not sufficient enough. Though, at a later stage, a number of students enter the institutions of higher education. After all, the learners having a certain level of knowledge, abilities and values are treated as the main staff for universities. Logically, if graduates' education is not good enough, a university fails to train high quality specialists. Meanwhile, worlwide practice shows that universities own high potential that is not always appropriatelly used. Statistics indicates that only 21% of the EU citizens capable for work are graduates from universities, whereas the latter indexes in the US and Canada are 38% and 43 % respectively. The communiqué of the European Commission declears that 'Europe needs modernised universities. The main question is how to increase our universities' contribution to the Lisbon Agenda for more growth, and more and better jobs' (Education and Training..., 2006). The document examines the quality of higher education provided by the European universities.

During the recent decade, due to reduced complexity, the programmes of social rather than natural sciences and technologies have been the most popular subjects studied. On the one hand, it is a common position, on the other– due to various reasons, the young generation in Lithuania and other countries of Central and Eastern Europe is not sufficiently focused on choosing sciences as subjects to be studied as in this case, in order to ensure the development and quality of programmes, apart from declarations, real financial and intellectual resources are required. Natural and technological sciences are primarily devoted to the development of manufacturing and technologies. Analogical sciences must be competetive under the circumstances of rapid globalization in the economical and informational space worldwide. However, only universities cannot improve the situation as a general clear national policy is required. It is worth pointing to the international ROSE research which disclosed that the youth' interest in sciences and technologies was markedly decreased in the so called developed countries (ROSE, 2008). Certainly, teaching sciences and technologies in comprehensive schools should be enforced.

High quality higher education is a solid basis of individual and public intellectual property. Finally, the mission of higher education is to offer competitive priority to its receivers now and in the future. Not everything can be controlled by the existing market as higher education first of all, is an individual property. Therefore, it is not necessarily must be related to the labour market. Higher education is essential to a person him/herself (for young people in particular) in order to consider a personal model of life, to form a unique world outlook and to grow up as a personality and citizen. In this particular case, university implicitly orientating towards the needs suggested by the market, is not suitable for such mission. To save the idea of university worldwide, the latter aspect is exceptionally meaningful. Higher education cannot be treated as a purchase sold in the market.

Higher education policy becomes a key point. In any case, the quality of higher education cannot be independent neither from science and studying policy of a certain

country nor from a policy of a particular university. University autonomy and administration and implementation of science policy at national level are two closely integrated components having a direct impact on higher education. The European Union has established high and ambitious standards. One of those is a steady increase of Europeans' education. Thus, Lithuania must be ready to meet this challenge. The number of educated people cannot enlarged. The quality of higher education is an integrated part of standard of living and citizens' welfare.

2008
Problems of Education in the 21st Century, 7, 5-8.

EDUCATIONAL POLICY IN TERMS OF THE CONCEPT OF MODERN LIBERAL EDUCATION

AT the outset of the 21st century, education evidently faces a number of challenges and transformations (frequently baseless) at all stages including national and international level. Such situation is primarily determined by political, economical and cultural changes in society life. New complex problems are encountered at the crossroads of global and local tendencies. On July 4th 2003, under the resolution No IX-1700 put forward by the Seimas of the Republic of Lithuania, National Education Strategy 2003 – 2012 was approved. The document states that „education should be developing having in the forefront all new challengies and possibilities for a society... (Regulations of National Education Strategy, 2008). What kind of assistance should be given to the members of society? This is the key issue that needs to be clearly defined as we are living in a consumer-centred world based on consumerism and pragmatic morality. In general, modern Western Civilization is a capitalistic and global society mainly focused on consumerism. What is more, the attitude that this is the only universal and approved system is formed. Too many economy factors make impact on the pattern of life and thus on Lithuanian education. Economic logic determines education policy in Lithuania as well as in a number of countries. Education seems to be a sort of service that can be clearly noticed in the sector of higher education. Almost no ordinary life at university has been left – life is more focused on providing services, attracting customers, making money etc. It seems to be that the idea of university has been carefully hidden underground and waiting for more promising future. The students have become customers offering money for universities. Therefore, even a more pragmatic outcome is elaborated as the establishments of higher education are expecting everyone having enough money to pay for studies. Individual ability to study is undeserving and stays out of the way. Universities may vary from providing poor quality services to those very positively valuated by the customers. However, I suppose that slight marking exists which once removed pushes a university towards the nowhere (only a name and signboard of an institution remain visible). More and more university degrees are obtained in Europe and North America as well as in the rich

countries of Saudi Arabia, China and Japan. It comes with career opportunities and tells about our imaginary success. Nevertheless, it is only an external aspect including mobility, changes, variety etc. However, such paradigm of global education and production/consumerism contains prior evaluation. The market value of those unable to satisfy the established criteria significantly decreases and thus leads to uncertainty whether they can be appraised in general. In this case, *winners* and *losers* are formed in the system 'prosumer – consumer'. The only question is about the quantity of those and whether the assumed winners are as they have to be. Certainly, it comes true. Still, even the most socialized capitalism (Scandinavian) fails to escape from the ideology of consumerism.

The young generation encounters the tendencies of society's growth (or regression?), follows daily life and appropriately develops individual world outlook. It is true that comprehensive school cannot aimlessly foster the values that should be cherished as a part of a schooling mission. The principles and values cherished or encouraged by school environment most frequently appear at a standstill in Lithuania. The world is different outside school walls. The youth experiences severe difficulties in such discrepancy and avoids trusting in school. They clearly distinguish between things declared at school and underlying reality. Axiomatic truth declares that the mission of education is fully accomplished when its evolution goes beyond a general development of society. However, to achieve the purpose, the Government must pay real rather than declarative attention to the education system. Supporting the ideas of modern education, knowledgeable society, the development of information technologies etc. is not enough to fulfil the task. Any state finds insufficient upraising education as a national priority because valuable and regular assistance is required. Nonetheless, the youth in Lithuania is observing other type of 'concern'. The teachers of comprehensive and the lecturers of higher schools are forced to go on strikes to show they are worth getting more attention than they are presently given.

Recently, Lithuania and other countries of Central and Eastern Europe very frequently run into a number of problems addressed to the system of higher education. The decrease of the quality of studies, corruption, insufficient financial support, the inadequacy in reality and university mission etc. are the issues in progress. Everyone knows that in order to survive and compete in a knowledgeable society, all countries, especially small ones, must learn how to create, accumulate and manage intellectual property. Knowledge is the only resource to be accumulated when using it. It is extremely important for small countries having insufficient natural resources. Yet in 1999, the rectors of 14 higher education institutions in Lithuania declared that on the 20th of December of the running year, a preventive action *Higher Schools against Destructing Education* would be performed and that no academic work would be done that day. It seemed to be a matter of great concern. If higher schools are made to go on a strike, obviously, serious problems may occur. Although almost a decade has gone, still the situation remains the same. The sector of higher education in Lithuania is waiting for

going out again. A few weeks ago, mainly the same requirements for the Government were presented i.e. the salary of the teaching staff and operating-household personnel should grow 20 percent in 2009. Particular attention is devoted to improve the present situation and achieve that the Government should adequately support the students and allocate necessary finances for studying. Currently, considering different types of methodology, the Government totally spends only 48 percent of the sum of money required for studies. Another concern is the salary of staff as due to low compensation for work, universities may encounter difficulties in recruiting appropriately-qualified staff at all levels. In higher education sector some negative tendencies recently are observed. Many experts of higher education underline that the Western universities get attributes of the original enterprises (clients, services etc.). In the centre of attention the finance, servines, and „the goods", instead of formation / preparation of well-educated young people. The main mission of any university is positive influence on society development. Despite that the tendency of the estrangement of universities from the traditional value orientations is strengthened. Similar tendencies can be noticed in Lithuania. The universities that have been accepted as the temples of knowledge have become the tools of the powerful market. A.Samalavičius (2003) notices that one-sided orientation is very dangerous when a university becomes an institution of trade and highly specific vocational activity. Hence, following such logic, universities turn into the market and university education becomes a simple item. A customer always feels right in such higher education market. It seems to be clear that customers have different needs and possibilities to be accepted. Consequently, the curricula of university studies will be designed following the concerns of the companies that may appear as the potential employers of students. Bearing in mind that the post- soviet youth is not selective enough, it is likely that one will try to get the required diploma rather than necessary education. After all, in one way or another, the above introduced process is in progress. Besides, the problem is more than pressing. An evident satisfaction of students and businessmen' needs translate the university not into the force forming society but into a usual market agent playing an invaluable beforehand defined role. Fundamental knowledge is not treated as a marketable product in such political-economical conjuncture. A narrow point of view creates an impression of disengagement. Universities take a flexible position on the market needs. Nevertheless, it seems to be an illusion. Even the satisfaction of the speedily varying market needs shows understanding that in order to effectively design the curricula of studies, a broad theoretical background, for example prognostic, is necessary. Universities carefully observe market fluctuations, and thus become doomed to failure.

An interesting point is that depending on the number of students per thousand citizens Lithuania falls into the category of the EU member states having the largest number of students, however, considering the average allocation received by a single student of a higher school, we are lagging far behind other European countries. Thus, the system though has limited resources, 'produces' a number of graduates. The number of received graduation certificates cannot be an index showing the level of education.

Bright students and those having high motivation and ready for further studying choose the universities in Western countries. The process of the so called 'brain drain' is taking place. Different onetime actions are arranged to provide improvements on the situation (for example, Design and Implementation of Brain Drain Programme). Therefore, can we accept the present situation as an outcome of democratic education? Taking into account that democratic education is mediocrity-oriented mass education, the situation should not be a matter of great concern as this is a sort of education for the majority. So, the question is if '*liberal education*' vs. '*democratic education*' should be the only real way of overcoming the problem? 'Liberal education' is evidently not 'democratic education'. Simple life-based logic confirms that if having one thing, you loose another. Are the contracting parties facing the problems of higher education ready to choose another option? Are universities determined enough to form national policy and at least minimally participate in the process of arranging it or on the contrary, they will start receding from policy and stay 'shut in' becoming the blind executers of the beforehand adopted ideology? Several countries of Central and Eastern Europe have already dealt with the above introduced situation? An interesting example is that in 2004, the Chinese Government organized a conference and invited 30 leaders of the most prestigious universities worldwide including the representatives of Harvard and Oxford. The final outcome of all discussions was that China preferred fundamental education as the foremost one at national level.

Shortly after restoring State Independence, a conception of education at national level was formulated. It is a paradox, however, that in the above mentioned conception, we can hardly find such concepts as liberalism and conservativism. A major objective was to design a concept aimed at national traditions and the needs and interests of a modern society. The core of the conception is an effort to combine the conservative and liberal tendencies of education. Such steps as the renewal of gymnasia, the revival of teaching religion, awakening confession schools, look back at national culture and history etc. are the vital elements of the conservative tradition. On the other hand, a private sector of education, the right to choose educational institutions, competition among educational establishments, the growth of market relations etc. are the apparent elements of liberal policy. Within the period of almost 18 years of regained independency, the Lithuanian Government has changed from the extreme left to the extreme right wing. It can be treated as an objective stage of development in the post-soviet countries. A valid point is that the political forces of both sides have mainly failed to make corrections to the already formulated and implemented concept of education. A number of political decisions in the field of education have been reached in light of the business concerns of narrow political groups rather than taking into account clear value-based political attitudes. This type of behaviour is characteristic of the whole region of Central and Eastern Europe and is frequently narrowly accepted by western countries. I suppose that too liberal (which means cosmopolitan) attitude to education has a destructive character when fostering national traditions and values inherent to

small countries. On the other hand, the liberal education system of Great Britain could serve as a good example. This is a tradition of British education. However, it does prevent neither from corruption nor from the fictive organization of studies or receiving diplomas and in general, from plenty of problems encountered by the system of education. As far as you know, education policy was decentralized in the Soviet Union. Some countries have strict regulations issued but a few of those follow very liberal traditions. Both positions, after Aristotle, can be considered as extremities. Education in a modern world has turned into a huge market which means that relations here are not always based on values and common decency. The problems facing the illegal producers of the certificates of higher education, the counterfeiters of scientific degrees, illegal studies and establishments of 'higher education' have become burning issues in a number of countries. The powerful market demands not only for knowledge and real qualification but also for '*paper-based*' pseudo-education. Thus, the conception of real education and background is being obviously devolved.

Liberal commercialized education in Lithuania is not the exact way to be followed. The approach of cosmopolitism, disorganization and denationalization cannot be acceptable to Lithuanian people as it may cause national decline. In this case, I do not support a position that liberal education acts either as absolute evil or absolute good as much depends on the context and various circumstances. Proper (elite) education apparently brings neither honour nor conscience etc. for a person. Excellent education can be available for dishonest and corrupt people. Therefore, such education can be used for deceiving society on a broader scale. In this instance, the importance of national-value-based substructure in the whole framework of human education can be clearly noticed. Unfortunately, following only the liberal concept of education cannot act as the basis for forming such substructure. Only the citizen of Lithuania having emotional spiritual culture-focused relation with national and human historical experience uncloses new sources of property power for freedom and creatively develops informative and financial (economical) relations with all people (Srėbalius, 2002). Finally, manipulating the concept of 'citizenship' is very modern nowadays. However, the situation when citizen, citizenship, civil society, civil nation or civil education based schooling do not reflect even the smallest part of Lithuanian nation can only get to *homo sovieticus times* and nowhere else (Nainys, 2008). It is expected that Lithuania as well as the other countries of Central and Eastern Europe will find the most appropriate way to develop education and nation prosperity. It is worth making a question whether *eudaimonía* by Aristotle is somehow reflected in the current education policy? I dare to say it is not. Will we come back to the *Aristotle's Golden Mean* formulated in the 'Ethics' the essence of which the balance between excess and shortage? The question is still open and every idea about this issue will be accepted to be appreciated.

2008
Problems of Education in the 21st Century, 8, 5-8

QUALITY OF EDUCATION: FASHION OR NECESSITY?!

"If to yesterday's efforts we added some new ideas and developed something, today we would step forward comparing to yesterday. You don't have to idle your time away but do it better. Later this will reward you with brilliant results. You don't have to go along the same path you have been accustomed to go, - this is the mystery, only having realized it you will reach success"

Kazuo Inamori

ONE of the quality theory models, undoubtedly, is quality management. At the end of the 20th century and at the beginning of the 21st this model becomes perhaps the most fashionable in management theory. We can say straight away that what can be fashionable it is not always right and reasonable. Is it in reality so? It is hard to pretend to exhaustive analysis in this article however, it is purposeful to pay attention to some things. Another argument – history knows plenty of examples when different theories wouldn't grow from "infancy" stage, wouldn't pass on to a practice level, at best they would remain only a mass of pompous slogans. Speaking about quality, such attitude, undoubtedly, has its own positions. Alternative approach has positions as well which claims that quality management ideology and philosophy is not only a common short-term campaign, but a serious universal movement.

In recent years, quality is quite a lot discussed in Lithuania too. We should agree, that not only discussed but something is being done about that. It is not always well and in the right way but done. And this is much better than to speak in vain but do nothing. It is quite logical to claim this because watching discussions on quality questions especially in the education sphere we can safely assert that there is more speaking here (very often simple twaddle) than real doing (quality improvement, guarantee and so on). Not one educational organization describes quality as a crucial priority of activities. However, to describe and declare is one thing and to really seek that quality is quite different (Lamanauskas, 2009). This is because of various known and unknown, objective and subjective reasons. Lithuania as the other post soviet countries about two decades ago from half - close space comparatively quickly occurred into the space of great transformations. From this point of view, bigger or smaller mentality remains in the consciousness of people make them behave in one way, speak in another, and think

quite differently. There are a lot of manifestation examples of this phenomenon in educational sphere too, especially in that which is related with the questions of quality improvement. Moreover, collision of post-soviet and so-called western mentality causes unique people's behaviour, thinking and other models. The question what the quality of education is about in such context is urgent. Fashion and/or necessity dilemma in Lithuanian context is open, requiring profound discussions.

Different processes are taking place in every educational organization. In some of them, there are more of them, in others less. In some places, they are complicated (e.g. in higher schools), in other places, they can be simpler (e.g. non-formal educational institutions). However, in all places they are relevant and have to be carried out qualitatively, in other words, to satisfy fixed requirements. Some of the processes are important because service (future production) quality depends directly on them, the others don't have direct influence on service/future production. It is obvious, that all these processes, both basic and secondary are equally important and only acting closely with each other they can guarantee success of organization activity (systematic approach).

Another important aspect is quality standards. It is not a secret that almost no attention is devoted to them in educational institutions. Quite often there are attempts to create some distinctive standards whereas, on an international scale ISO family standards are recognized and function. It is understandable that educational institutions are specific, they differ greatly, let's say, from business organizations. Nevertheless, international ISO standards can and have to be applied. It is necessary to understand that not everything is regulated by standards (for production or service). A lot depends on other factors, which are not regulated. There are a lot of such factors in education structures. Standard is very important when organization is looking for recourses (raw material). As a rule, in educational organizations they are people who study/learn. Let's say, "the new" Lithuanian higher education reform, as a matter of fact, has turned the quality management conception upside down. Generally speaking, this year both universities and colleges invited to study all wanting. The main criterion is the ability to pay for studies. The logic of the standard is simple. If we were talking about raw material, so the standard for raw material would be a window, the size of which is clearly fixed and invariable. If all wanting don't fit in, it means that don't. However, "the window" isn't being extended for everybody to fit in. So-called "window" in Lithuanian higher education sector has been stretched so much this year that it is not clear what in fact, the criteria for future students are.

Keeping to process approach, which is fixed in ISO standards, every organization should effectively control all processes taking place within its boundaries. Everything what is going on in processes, later on in one way or another reflects itself in production/service. I need to say, that process control in educational organizations is rather problematic. If the control happens to be, then it is broken up, fragmentary. While controlling processes, we escape defect. It is obvious. Thus, we have clearly to

know under what conditions one or another process is going on. We need to be able to assess these conditions, but be able to affect the processes (to influence), in order they went on properly. Not in vain, in recent years more and more attention is paid to statistical process control (SPC). It is a constituent part of statistical quality control (SQC). It is thought that this is a new thinking in quality sphere. The goal of statistical process control is to make processes work maximum effectively. Such thinking is based on three essential principles: any work or carried out activity is a consequence of some processes, all processes are variable, not stable and the decrease of variability is the key to success. From this point of view, the appliance of statistics in quality management is very urgent. I have to state once again, that Lithuanian educational institutions and especially comprehensive schools pay not sufficient attention to this. Very often, they limit themselves to quantitative indicators or just ordinary descriptions, stories about quality. It is even stranger when quality is described counting only on the learners' opinion. It is being forgotten, that while assessing qualitative indicators it is purposeful to turn them into quantitative. Of course, criteria are various and various ones should be matched. I have in mind, if it is sensible to count only on opinions and approaches to quality. Therefore, it remains to recommend educational institutions use more broadly the standard ISO 10017:2003 about statistical methods. This standard exactly regulates what statistical methods can be used in quality management. Attention should be paid to this, that statistical methods help to measure, describe, analyze, interpret and so on information even having limited (not full) data. Statistical methods for quality control can be useful in various spheres, but it is not enough to control only. It is necessary that on the basis of available information it would be possible to influence processes in the direction of their improvement. Even if the stability of the process is rather poor, statistics can show how to solve one or another problem.

Management theory postulates three essential questions: a) what is, what was and what can we expect? B) why do we have this, what do we have (giving reasons)? C) how to improve quality indicators? This obviously reflects systematic approach in quality management. According to prof. Vasilkov, this is a chain of three essential elements – anamnesis-diagnosis-treatment (Vasilkov, Injac, 2008). This approach is particularly relevant in all educational organizations.

In recent years Lithuanian higher schools especially set themselves to improving the quality of studies. Practically, we will find in all universities' activity priority list that quality management and study quality improvement is one of the most important things. On the one hand, it is not so bad, on the other hand – usually there is no a clear quality management system. Separate existing fragments do not mean a system. Very often, the systems being created are amateur, i.e., do not conform to any international standards. It is obvious, that it is not enough to describe quality as priority. Quality does not improve by itself. Constant efforts are necessary for this and, first of all, institution administration understanding and attention. Understanding is particularly important in this sense, because nowadays very different quality conceptions exist; it

is difficult to orientate oneself in their abundance. At last, a very urgent question for educational institutions is the question of financial investments into the implementation of quality systems. The results are very often not very bright or quickly noticeable. A part of results comes into light only after a certain time.

Speaking about Quality management in Lithuanian higher schools it is worth recalling that not only studies are being organized in these institutions. It is paradoxical that quality problems usually start and finish with the improvement of the quality of the studies, leaving the science process and other important processes aside without which study process itself in principal, is impossible.

The most important international documents such as Bologna Declaration (1999), Lisbon strategy (2000), Prague communicate (2001), Salamanca Convention (2001), Berlin communicate (2003), Bergen communicate (2005) and other emphasize quality assurance importance for the development of higher education. In Lithuanian juristic documents as well, more often attitudes related to quality management occur. For example, in LR Education law alteration law (confirmed on 17th June, 2003) an attitude is inscribed that education quality is the responsibility of education provider and schools must assure good quality education. Another Lithuanian example is the project " Pupils' achievements external assessment and research guidelines for the years 2006-2012" in which it is set to create an integral education quality measuring system, which would allow to objectively assess education quality in all country schools (Pupils' achievements……2009).

All this shows that quality management ideas rather quickly spread in educational organizations, despite not very small resistance. Only need is not sufficient for quality, the ability to take responsibility is more important. At last, high managerial competence is necessary. You can have necessary and timely information about processes taking place in the organization, however, this doesn't guarantee that suitable decisions will be taken up.

Thus, there is no doubt, that implementation of quality management systems in educational organizations is very urgent. One can ask why it is urgent? First of all, it is because that general quality management philosophy is more and more developing and becoming more acceptable. Quite often one can hear the opponents claiming that ISO standards don't suit for educational organizations. It is true, that ISO standards are rather universal; therefore, it is not easy to adapt them in the education sphere. On the other hand, such programmed universality gives more action freedom, forms conditions to assess specific character of every concrete organization. Quality management system forms conditions to control not separate, broken up processes or activities, but see them as a whole entirety. Undoubtedly, this is very important seeking to guarantee vital capacity of concrete organization. The second obvious truth is that quality in education sphere is getting worse, competition gets stronger and this in its turn makes organizations search for ways and strategies of making their activities more effective. The third thing is that today in Lithuania and not only in Lithuania, job and education

markets do not match. A gap is rather big. Thus, it is not enough to teach, we must know clearly what we teach, how we teach and who for we teach. Undoubtedly, quality management system implementation is a serious instrument to virtually improve the activity of all educational organizations.

2009
Problems of Education in the 21st Century, 15, 5-8

SOME SKETCHES ON QUALITY

RECENT problems of quality management have gained a diverse character. A number of organizations at different levels actively seek for implementing various quality management systems. A part of those are based on ISO standards, whereas the rest employs other measures. Despite these variations, the actions taken must be properly performed thus avoiding situations when the issued certificate only plays a crucial role. The key objective is to ensure continuous improvement and personal competitive advantage of activities stimulated by an organization. The writing does not focus on all above introduced questions. The only point is that frequently the implementation of quality management systems is really a rather formal and superficial process, i.e. certain call of fashion, discussing the fields of social affairs, education and culture in particular. It seems to be clear that the latest concept of quality is very chaotic as there are a number of different and often contradictory definitions. The abundance of quality investigations is really surprising. Quite a few researchers deal with the quality aspects of a certain area in one or another way regardless of the type of the sector, for example, manufacturing, services, etc. It should be noticed that discussing the issues of quality have sometimes become a modern occupation. A great number of recently developed models, theories and concepts have put forward an argument this is positive and allows for a better understanding of the phenomenon of quality. Though this position is fully acceptable, nevertheless, methodological chaos is not a popular idea as such an undefined state requires certain systemic perception. Still, investigation into quality phenomena is very complex and controversial, and therefore more attention should be paid to a more systemic understanding of quality management. Quality declaration means almost nothing. Different development strategies, plans, etc. designed by organizations cannot be proposed as focused documents. They must refer to the conducted empirical research, i.e. quality cannot be only a political commitment followed by an organization. Quality, first of all, must be treated as economic necessity. As mentioned above, the implementation of quality-based systems have become an integral part of business activities stimulated by organizations. However, if this way of implementa-

tion carries an imposed, unrealized and unsubstantiated character or has been determined by external pressure, such a system is not effective and significantly decreases the efficiency of activity the organization has been involved. Similarly, the enthusiasm only expressed by the staff members is not a sufficient component in maintaining and advancing productive management systems. Lithuania faces serious problems of quality management due to the fact that it was incorporated in the former Soviet Union and gained invaluable experience when low-quality products were awarded the so-called 'quality mark". Meanwhile, the concept of quality and practical experience in western countries have developed in a different way, i.e. the standardization of products created the opportunities to control the quality of production (level of quality) manufactured by different companies. The approved level was accepted as the one matching to the established standard. Thus, the 8th decade of the 20th century mainly faced a fundamental turning point of the paradigm: from 'I can sell everything I can produce' to 'I produce everything I can sell'. Since then, the concept of the quality of products (services) has been given new content that corresponds to the needs of a customer. Requirements for a static form imposed in the standards gradually have become dynamic constantly and rapidly changing requirements that depend on the existing situation in the market and the needs of a certain customer. However, the nature of the standards has been inevitably modified. Thus, some countries encountered difficulties in accepting the new paradigm.

The recent decade has also extensively explored the issues of quality conducting, as mentioned above, a large number of fundamental and applied researches in the field. After the collapse of the Soviet Union, the occupied countries have restored or declared independence. The great majority of questions, including quality management, have been a new and serious challenge. Nonetheless, stormy debates still have been taking place, and the number of different organizations offering services of implementing and certifying quality systems is increasing. Quality management have become a serious business as some of the organizations have earned huge profits. What is more, the following tendency can be noticed: organizations usually take the easiest way – they prefer buying services rather than are themselves involved in the processes of implementing, maintaining and improving quality systems. A decreased or insufficient internal interest of an organization results in a situation when quality becomes only a declarative subject. We obviously start 'getting tired' of using an excessive and frequently unjustified concept of quality. A decrease in engagement and a lack of interest in quality has become a problem across Europe. At the moment, no clear answer has been provided. Thus, what are the reasons for such a tendency? Again, the question remains unanswered. The only point should be considered – the amount of information on quality management is sharply increasing. On the other hand, one can notice an unreasonably growing number of people involved in quality management activities. As for Lithuania, it is worth putting emphasis on the fact that all

institutions providing university education services, in one or another way, prepare the specialists of quality management. The curricula of such a profile have tuned into a sign of a good manner. As discussed earlier, the business of certification and giving advice has been rapidly developing. What is the degree of the efficiency of similar activities? We can hardly expect a full answer to the provided question. A growth in pessimism and disbelief in the quality management system as the one providing real benefits to the organization have evolved into a matter of concern. Understanding a quality management system as a bureaucratic arrangement the real output of which is only a requirement for an issuing a certificate has emerged as risk to quality management systems in general. Contradictions at a methodological level have been also increasing. For instance, though plenty of quality management systems have been implemented, however, the experts in the field of quality fail to agree on the aims of quality and the way they should be applied to one or another organization. The explained situation requires in-depth discussions at all levels and investigations into the questions about the quality of rapidly increasing information on the basis of which management practises have been created and developed. After all, according to Charles-Maurice de Talleyrand-Périgord (1754–1838), 'those who own information – rule the world'.

2012
Quality Issues and Insights in the 21st Century, 1, 4-5

SOME EDUCATION QUALITY MANAGEMENT SKETCHES

IT wouldn't be right to say that quality management questions in Lithuania are perfectly known, analysed and there's nothing to do in this sphere. On the contrary, this sphere remains very urgent, on the other hand, rather complicated. Comparing with the other countries, having a big and long-term experience in the quality management sphere, Lithuania is an undoubted novice. This was conditioned by historical, political and other circumstances. As it is known, in 1967 Soviet Union introduced State quality mark. It is natural, that it was a must to use it in occupied Lithuania as well. The Soviet government tried to raise social production effectiveness, so this sign was used to mark a wide range of high quality consumer goods. It is worth noticing, that this mark was often used as a simple fiction, i.e., poor quality goods were marked by this sign too. This practice was very distinct in 1970-1990. After re-establishing independence in Lithuania, quality management questions are solved referring to international practice, orienting to international quality standards. However, this is not an easy task. Fictitious quality conception, having formed in society's consciousness, remains one of the main obstacles in this sphere. The mentioned soviet quality mark does not enter the list of banned soviet symbols (such a list is confirmed and valid in Lithuania), therefore, one can still find such mark on some goods imported from Russia. This context is important in this sense, that in certain society layers a cautious and ambiguous attitude still remains to any of the quality questions.

Speaking about education system, quality problematic is especially important. Here, the purpose is not raised to exhaustively discuss education quality management, but it is sought to make some of the most urgent quality management questions in the higher education sphere more distinct. In the environment of changeable higher education, labour market changes, increasing organisation and society requirements in higher education institutions, quality management questions are becoming more relevant and this is the world tendency. Growing competition, learners' demands and their expectations encourage quality seeking. Both the decreasing number of students, and government critics concerning higher education and study quality, determine this

in Lithuania. Higher education and study quality is not an abstract thing and depends on very concrete things – higher school activity management level, modern study programmes, the latest news professionally conveying lecturers, academic society clear motivation system and other. On the other hand, binary higher education system functions in Lithuania and this means, that such system contains colleges (non university higher schools) and universities. It is natural that a rather sharp competition takes place among them. It is necessary to draw one's attention to the fact, that quality management questions are complicated and complex. Analysing various information, and also evaluating public discourse it is seen, that over the last 10-15 years, in Lithuanian higher education sector attention has been focused on study quality. It is obvious, that studies is one of the main university and college activity processes. Study quality improvement, in principle, is not possible without making scientific activity more effective. Studies inevitably have to be grounded on science, the newest science achievements. However, some main contradictions lie here and it is difficult to solve them. It does not mean that a perfect and perspective scientist is a good lecturer as well, and vice versa. In this respect, scientific activity influence on study quality is conditional. On the other hand, the requirements for the learners are apparently too low. Studies and work activity have become a norm in recent years not only in the first, but also in the second stage studies. Students do not want to devote too much attention to studies, often studies become only some kind of attachment to the main activity. This cannot be justified only by an economic situation. Higher schools, not wanting to lose students, have put up with such a phenomenon. Also, it has to be mentioned, that still low university teachers' salary has an influence on education and study quality. Various created staff motivation systems are usually of a declarative character and do not initiate any necessary changes. No doubt, that a number of other factors exist, however, already the mentioned ones show, that quality management questions cannot be solved isolated. Quality management complexity requires systemic attitude.

Practically up to 2009, quality management questions in Lithuanian higher schools were solved rather fragmentally. In 1995 Study quality evaluation centre was established in Lithuania, the purpose of which is to encourage higher schools to make the study quality better, to help improve the studies, inviting foreign and Lithuanian experts for the evaluation and other. Though the international study programme expert evaluations have been running for a long time already, however, only in 2009, after having changed LR Education and study law, the requirement appeared for the higher schools to implement quality management systems. It was a strong encouraging factor. Lithuanian colleges were especially concerned with the implementation of QMS. As it is known, in 2000 in the higher school basis, the first non university schools – colleges, have been started to be established in Lithuania. It is noticed, that up to now, higher non university schools still feel a lower status, comparing them with universities, and in order to strengthen their position in the market, they search for mechanisms, how to improve their activity, how to make the study quality and image better in general. It

has to be noted, that quality management systems (QMS) in Lithuanian colleges have been started to implement without having a clear conception and basically keeping up with the political requirements. On the other hand, QMS are tried to be shown as an advantage over the colleges competing both with universities and among each other. So far, this process has been running inconsistently, the goals of implementing such systems and the targets are not clear.

In Lithuania, according to the data of 2013, totally have been registered1800 study programmes (https://www.smm.lt/uploads/lawacts/docs/669_0ecba67bf799b7290bac196e531ae615.pdf).

Today, a young man can choose from plenty of various study programmes; however, unfortunately, there are a lot of misguided students who are willing to study only in a higher school. Various researches show, that the students often realise the goals and the main differences of university and non university studies too little. A part of them, having chosen colleges, very often regard them as courses for preparation to study at universities. Lithuania has to make a decision, what study programmes have to be realised at universities and what - at colleges. It is obvious, that a big part of study programmes are very similar, though implemented in different type of higher schools. The main idea is forgotten, that college study programmes are mostly oriented to practical and university ones - to academic activity.

Also, it would be good to emphasise, that economic higher school activity context is important too. It is obvious, that the investments to education and study quality in universities and colleges require a lot of expenses. Quality does not appear in itself, declarative quality does not mean anything. It is paradoxical, that the results of such investments become distinct only after a certain time, in other words, they reach the market rather late. Being the competition strong and financial recourses limited, such situation requires not only nonstandard higher school decisions, but a much more rational state attitude. It is also understandable, that only financial leverages do not change the situation. Strong institutional inertia still remains in Lithuania, which, as it is mentioned at the beginning of the article, occurs from historical experience. Unwillingness to change, an intention to solve problems temporarily, declaratively, still remains rather strong. Corporate conflicts are not useful for school administration either. Very often, the matters requiring hasty decisions remain isolated inside the institutions, believing only in self-changes.

Thus, it is hopeful, that regardless of all the existing obstacles and contradictions, quality management questions will be solved more effectively in Lithuania. From the formal point of view, quality management system implementation shows, that all organisation - every member of it - contributes to constant changes and activity improvement. On the other hand, quality management is not only internal higher school competence thing. A responsible higher school has also to align to national and international quality management standards, to seek its carried out activity to satisfy the universal quality management standards. Both universities and colleges, as service

providers, should orientate to international quality standards in their activity and to really take a responsibility to satisfy their consumers' demands and to constantly improve service supply. There can be a lot of discussions about various present and future challenges, market demands and so on. However, no instruments will be effective, no procedures will work, if the thinking is not changed. This is a vitally important question for Lithuanian university and college societies.

2014
Quality Issues and Insights in the 21st Century, 3 (1), 4-6

REFERENCES

European Council. (2000). *Lisbon Strategy*. Lisbon. Available online at https://portal.cor.europa.eu/europe2020/Profiles/Pages/TheLisbonStrategyinshort.aspx.

Education and Training 2010 Diverse Systems, Shared Goals (2006). *European Commission Communication*. Available via Internet: http://ec.europa.eu/education/policies/2010/lisbon_en.html (04.06.2008).

Inamori, K. (2006). *Gyvenimo filosofija* [Philosophy of life]. Vilnius: „Versus aureus".

Lamanauskas, V. (2003). *Natural science education in contemporary school*. Siauliai: Siauliai University Press.

Lamanauskas, V., Vilkonis, R., Klangauskas, A. (2007). ICT usage for natural science education in comprehensive schools: Experts` position on the issue. In.: J. Gedrovics, G. Praulite, A. Voitkans (Eds), *Didactics of science today and tomorrow* (Proceedings of International Scientific Conference, 15-16 March, 2007). Riga: RPIVA, p. 107-139. (CD-Room).

Lamanauskas, V. (2007). Studijų kokybės miražai [Studies quality mirages]. *Lietuvos Aidas*, *208*, 1, 3.

Lamanauskas, V. (2009). Nuo kokybės valdymo prie valdymo kokybės: sisteminis požiūris [From quality management to managing quality: Systemic approach]. *Švietimas: politika, vadyba, kokybė / Education Policy, Management and Quality*, *1* (1), 4-8.

Mažulienė, I. (2002). Informacinių technologijų įtaka ugdymo procesui, fizikos pamokų ir projektinės veiklos planavimui [Information technology influence on the educational process, planning of physics lessons and project activities]. *Informacinės technologijos mokykloje*. Konferencijos medžiaga. Vilnius.

Mokinių pasiekimų išorinio vertinimo ir tyrimo gairių 2006-2012 metams projektas (2009). Vilnius: ŠMM. Retrieved from http://www.pedagogika.lt/puslapis/Svarstymas/svarstome.htm (Accessed 13 November 2009).

Nainys, B. (2008). *Mokyklų varpeliai skambėjo liūdnai* [School bells sounded sadly]. Retrieved from http://www.alietuvis.us/al/index.php?news=401 (Accessed 18 October 2008).

Plomp, T., Anderson, R. E., Kontogiannopoulon-Polydorides, G. (1996) (Eds.). *Cross national policies and practices on computers in education*. Dordrecht: Kluver Academic Publishers.

Samalavičius, A. (2003). *Universiteto idėja ir akademinė industrija* [The idea of the University and the academic industry]. Vilnius: Kultūros barai.

Science Education Now: A renewed pedagogy for the future of Europe. (1997). Brussels: European Commission. Retrieved from http://ec.europa.eu/research/science-society/document_library/pdf_06/report-rocard-on-science-education_en.pdf (16 January 2008).

Sendova, E., Azalov, P., Muirhead, J. (1994) (Eds.). *Informatics in the secondary school - today and tomorrow* (UNESCO International Workshop). Sofia.

Simonson, M. R., Thompson, A. (1990). *Educational computing foundations*. New York: Macmillan Pub. Com.

Srėbalius, J. (2002). Kultūros vaidmuo globalizacijos procese [The role of culture in the process of globalization]. *Gedimino universitetas: VGTU žurnalas*, *4* (28).

The Relevance of Science Education (ROSE) (2008). Available via Internet: http://www.ils.uio.no/english/rose/ (04.06.2008).

Valstybinės švietimo strategijos 2003-2012 metų nuostatos [National Education Strategy for 2003-2012] (2008). Lietuvos Respublikos Seimas, Nutarimas Nr. IX-1700. Vilnius. Retrieved from http://www.litlex.lt/scripts/sarasas2.dll?Tekstas=1&Id=65709 (19 October 2008).

Vasil'kov, Ju. V., Injac, N. (2008). *Statisticheskie metody v upravlenii predprijatiem: dostupno vsem* [Statistical methods in business management: available to all]. Moskva.

Woessmann, L. (2005). Computers could harm learning. *European News*, 47 (8/9).

ICT IN EDUCATION

DIGITAL EDUCATION: SOME IMPLICATIONS

IN recent years education space is saturated with various discussions and thoughts about the so-called digital teaching and learning. New technologies consistently and rather aggressively keep penetrating into educational practice. Therefore, we have to discuss in essence the urgent problems of digital teaching, to analyse the emerging challenges both for the teachers and students. On the other hand, it would be impossible to single out any one age group people. It is urgent both for the pupils and teachers of comprehensive schools and for the teachers and students of higher schools. However, it can be basically asserted, that for younger students these questions are much more urgent. Their experience in the sphere of new technologies is varied and at the same time inadequate to current teaching and learning practice. Let's say, not a small part of today's youth use the services of various social networks such as, Facebook, Twitter and other. The problem is that very often we don't know or poorly know what the educational meaning and use of such services is. Moreover, how to effectively use new technologies which are actively used by the pupils, in educational sense? Sometimes an impres- sion is made that existing educational practice reacts unwillingly to such challenges. It is obvious, that a rather sudden shift takes place in the system "classical pedagogy" – "online pedagogy", isn't it? There is also another shift in the system that is closely related with this shift, "from teaching to learning". It can be confidently asserted, that the latter shift is considerably overestimated and groundlessly given too much importance. Effective and productive learning is not possible without a proper teaching. These are two education system elements which are closely interrelated and influence each other. Only the weight of these elements differs in certain age periods. Therefore, a narrow and primitive interpretation of this shift is not acceptable. After all, in real educational practice also the third significant shift occurs, or more exactly, problem situation in the system "digital activities" – "non-digital activities is observed. How to keep a proper balance?

One has to agree with this, that digital teaching aids make teaching and learning process more interesting, more effective. However, this is not a direct dependency.

The final result depends on the whole complex of various factors. One of them is teachers‘ technological competence. Another thing is also obvious, that it is necessary to develop digital literacy of the youth. Thus, wishing to help the pupils properly, teachers are expected to co-learn, model, and facilitate the development of such competen- cies (Greenhow, Robelia, Hughes, 2009).

Analysing this sphere problems, a lot of questions arise which have to be answered in one way or another.

- Should Digital content replace traditional textbooks?
- Does Digital content make teaching/learning process more effective and helps to achieve better results?
- How will teaching and learning quality change using Digital textbooks and other aids?
- What does it mean digital teaching?
- Do we really need a digital teacher?
- Can we describe it as the new “high art” of teaching with digital technologies? etc.

Basically, it is acknowledged that digital teaching aids make teaching/learning process more inter- esting, more effective (Digital teaching..., 2010). Various research works carried out in foreign countries prove the effectiveness of digital teaching content. It is asserted, that digital teaching content (DTC) develops the abilities of corporation (Bennett, Sandore, Miller, 2001), strengthens motivation, being in- terested in general, develops thinking abilities (Miyata, Ishigami, 2007). Japanese researchers accentuate, that such format suits very well in lower comprehensive school classes (Murai, Nakagawa, Kobayashi, Iwasaki, Matsuno, Iijima, 2009), and in general, digital teaching content application in teaching/learn- ing process together with other technologies strengthens and deepens learners’ understanding (Dani, Koenig, 2008).

It is obvious that digital teaching/learning content is one of urgent fields. The essential idea is that only digital teaching/learning objects do not satisfy consumers’ hopes. The essential question is what the relation is between traditional teaching content tasks (published textbooks) and digital content. Should digital content replace traditional textbooks? Does digital content make teaching/learning process more effective and helps to achieve better results? How will teaching/ learning quality change using digital textbooks? and so on. In any case, the answers based on objective data are necessary and this creates a new research space (Lamanauskas, Šlekienė, Ragulienė, Bilbokaitė, 2011). Digital teach- ing/learning content, as research works carried out in other countries show, can be an effective means in the teaching/learning process. Besides, it is necessary to develop digital literacy of the youth. In the information society it becomes a priority direction in education. There is a lack of such research works in Lithuania. Quite often teachers practitioners “are experimenting” in a very limited

space and restrict themselves to only individual digital content component creation, e.g., of various computer teaching programmes. Exhaustive, of a wider amount experimental research works are necessary, allowing to basically assess DTC importance in teaching/learning practice.

It is obvious that science and technology develop very quickly and schools have to react on this situation – not only at the university level, but also at the level of kindergartens and primary schools (Hrbaček, 2011). However, it would be wrong to think that new technologies will change educational practice in essence. The history shows that this usually doesn‘t happen. The researchers notice that it has already happened in the history that people thought that new technologies, such as overhead projectors and film-strips made blackboards and other teaching aids obsolete (Malach, Mikošek, 2004; Hrbaček, 2011). It is likely to be the case. However, new ways, forms and means of teaching "are com- ing" to comprehensive schools everyday. More often so-called digital teaching/learning aids are used for teaching needs. Equally, a lot of difficulties arise , such as the selection of proper teaching/learning content, already mentioned teachers‘ technological competence, technical provision of schools with the newest ICT equipment and so on. After all, whatever way the problems are solved, there will always remain the search of a proper balance in the system „ICT detractors – ICT lowers".

2011
Journal of Baltic Science Education, 10 (4), 216-218

SOCIAL NETWORKING WEBSITES: NEW EDUCATIONAL SPACE

OVER the latter decade the spread of information communication technologies was going on in various directions. Technological possibilities grew up very significantly (Lamanauskas, 2011). Especially rapid was the development of the internet and technologies related with it. A lot of internet service providers occurred in the market, their number still continues to grow. The internet link methods change - from the ordinary usage of phone line modems (dial - up) to broadband internet technology (DSL) and cable TV internet nets. It can be asserted, that over the mentioned period Web 1.0 internet (static, used for getting information) was changed by Web 2.0 internet (social). The internet diaries, social portals, technologies allowing live communication on the internet (Internet Relay Chat, IRC), talk programme Windows Live Messenger (MSN), ICQ forums and other have occurred and are spreading. With the occurrence of "Skype", internet telephony acquired a qualitatively new characteristic and practically became a daily routine. Thus, today a consumer can create his profile on the internet, can make friends, communicate in the interest groups and so on. It can be stated, that every human being in his own way contributes to the internet and at the same time to ICT development, in general. It is obvious, that together with technological problems arise social internet problems as well. Social networking websites (SNW) are closely related with economical, psychological, educational, valeological and other aspects. There is a lack of researches based on socio-educational social networking website aspects. It is important to know not only how much time the consumers spend surfing the net, but how much time is allotted for communicating in social networking websites, which of them are the most popular and why, how the respondents evaluate social networking website functions, what in general they know about them, what advantages, disadvantages and threats they discern. Finally, it is important to find out whether usage of social networking websites makes information – communication abilities better in any way.

It is obvious, that usage of social networking websites is constantly growing. In Lithuania, a rapid growth of usage has been observed in recent years, taking into ac-

count local (national) social networking websites as well. Facebook.com is one among 10 mostly visited networks in Lithuania. Lithuanian consumers are not an exception – not a small part of them also use several social networking websites. Both in the world and in Lithuania, business takes an active interest in social networking websites. An evident tendency is the expansion of SNW possibilities in business environment. If earlier it was thought that usage of SNW is a waste of time, in the latter years business finds more and more reasons why social networking websites ought to be used. This is marketing, service and product advertisement, new client search, cooperation development and so on. The other thing – the amount and the flow of information will certainly not decrease and therefore information usage and management in general, will remain urgent.

The other tendency is also rather distinct. Social networking websites "move" into educational space as well. However, a great number of problems exist here. Nowadays teachers (speaking especially about Lithuanian situation) are not properly prepared in ICT field. Though ICT usage competences are being improved in general, however considerable gaps remain, the shortage of understanding is felt on how to apply information technologies, what their abilities are to make teaching/learning process easier, more effective and interesting for children. ICT in its own way changes rapidly, it is complicated to adjust to existing technological environment. On the other hand, nowadays children have grown up in ICT surroundings, in the environment more or less filled with technologies. This makes them more susceptible to technologies in general. Thus, teachers' society can't stay behind from ICT development either. Teachers themselves have to be ready for unpredictable future (or at least hardly predictable) and to convey this attitude to children. A continuous demand to improve becomes the cornerstone for every member of society.

The problem of motivation to learn and improve remains urgent. Despite education science achievements, motivation encouragement problem remains one of the most serious ones. However, watching children and teenagers' activities using ICT, especially social networking websites, a very high motivation, a demand to use SNW are fixated. Thus, it is important to use up that motivation in educational sense, in other words, to use up social networking websites abilities in educational sense. It is already a common and understandable thing in itself to speak about higher technologies in industry, medicine, pharmacy, agriculture and so on. Somehow it is spoken very little or not spoken at all about higher technologies in education (pedagogy of higher technology).

Nowadays a lot of various social networking websites (or technologies devoted to creation of social networks online and their effective usage) are used not only for entertainment, leisure or communication, but for teaching/learning purposes. E.g., in business field enterprises and organisations, there is a well known internal learning and informing system, using which one can operatively convey information, news and so on (Intra Organizational Learning, IOL).Very widely are used the systems devoted

for raising professional qualification both of teachers and students and in some cases for acquiring education as well (Formal Structured Learning, FSL). Speaking about social networking websites, a very significant becomes so-called accidental/spontaneous learning. This occurs when a consumer using social networking websites gets or finds out something new very often not realizing consciously it himself (Accidental & Serendipitous Learning, ASL). It is without doubt, that modern SNW in a certain sense realize accidental learning. Teacher's role continues to be problematic. It remains an open question to what extent technologies can overtake the teacher's roles of being a mediator and a human being; and this is indispensable since such a mediation generates students' cognitive and social processes and is a highly important factor for the whole learning process (Bregant, Aberšek, 2011).

Thus, can social networks carry out effectively educational function? Can they become a proper professional development instrument? We can formulate a lot of questions. The phenomenon of social networking websites is new and complicated, rapidly changing. The term itself "social networking websites" is rather new (2004). Quite often this term carries in itself a negative meaning. Not in vain, speaking about educational value of social networking websites, another term is used – (Educational networking, http://www.educationalnetworking.com/). The fact is that in the global world self-management learning becomes a distinct tendency in the field of cooperative teaching and teaching in general. Social networking websites and their technologies not only form proper conditions for such learning but also directly encourage it. It can be bravely stated, that the first social networking websites wave has already come down. Social networking websites creation, development and usage strategy is being thought in a new way. Educational social networking websites value remains a problematic and open question.

2012
Problems of Education in the 21st Century, 39, 5-7

INFORMATION & COMMUNICATION TECHNOLOGY PENETRATION INTO EDUCATION: SOME THOUGHTS

OVER the last decade the spread of information communication technologies has been growing very rapidly both in quantitative and qualitative meaning. Not only new, innovative technologies, but also various people communication forms based on these technologies have appeared. Here, it is spoken about so-called social networking websites. Their rapid development raises certain anxiousness as well. Education, as one of society life spheres, can't stay apart. The penetration of technologies in education is very great. The number of computers and computer technologies is expanding not only in educational offices, but also in the environment of every of us: homes, working places and so on. The youth is a very receptive group of society in this respect, seeking to try the newest technologies as quickly as possible. The majority of pupils spend quite a big part of time working on computers and using other computer technologies. It must be accentuated, that very often such kind of activity is not directly related with learning and self-education in a wider sense. It is obvious, that penetration of technologies enables educational community to work differently, to change educational process, to search for new approaches and so on. On the other hand, that raises certain problems and challenges. Though nowadays ICT technologies enable to get, process, save, convey and transmit information very effectively, on the other hand, realisation of information itself becomes problematic. In general, it is obvious that on the one hand, ICT provide quite big possibilities and on the other hand, they cause hard to solve problems. How to find a sensible balance between expectable benefit and probable harm? ICT in education isn't an end in itself, is it? First of all we have to orientate ourselves to effective technology appliance in the educational process seeking better education and self-education quality. Here, ICT competence question remains urgent. It is to do with educators, first of all. Technologies themselves do not improve anything or make effective, do they? It is necessary to be able to use them.

Another visible challenge is a rapid development of technologies themselves. The computer is sought to not only store, analyse and sort out the information in a different way, but also understand it. In this case, it is spoken about qualitatively dif-

ferent work (and communication) with computer. It can be foreseen, that there will be more and more challenges. Already now, it has been accumulated a lot of information, which allows to state that ICT penetration causes negative phenomena as well. This is, first of all, consumer health problems, unsafe and unfavourable working environment questions and so on (pupils very often waste a lot of time searching for information. Some pupils get computer and internet addiction. Pupils' activeness lessens, their health gets worse, they read books less and there is less of live communication). There is an apparent need to teach all level educational process participants the skills of safe computer and internet usage. This is very important for the young school age pupils, whose understanding about possibly negative ICT consequences is inadequate. First of all, teachers and lecturers should have these skills, which they could pass over to pupils and students. In other words, a sensible balance is constantly searched between ICT attractiveness and possible threats, between modernness and real, tangible benefit, between fashion and necessity and inevitability to use them while educating a man. It is worth to mention, that speaking about ICT quite often we use such concepts as faster, easier, simpler, more interesting and so on. However, that does not mean real education yet. School and university shouldn't become a youth entertainment place, where films are demonstrated or other so-called "playful" technologies are used during the lessons and lectures. Such education is sliding along the surface and is only its imitation. Therefore, it would be sensible to state, that both researchers and educational practitioners should pay greater attention to the research and analysis of "side effects" in future. This doesn't mean that disclosure of negative aspects would lessen ICT penetration into education in some way. This is not sought, anyway. However, it is necessary to control and lessen negative consequences in all possible ways.

It is important to emphasize one more moment. Not all ICT which are created have to be used in education. Analysing carried out empiric researches, observing real educational practice, an impression is often made that the use of technologies is as if understandable by itself. However, it is necessary to understand, that not all technologies are being created namely for educational needs. Quite a lot of examples could be given, when created technologies are artificially being tried to transfer into educational environment and into process while in these cases theoretic and empiric substantiation is obviously lacking. In this context, constant teachers and lecturers' sharing of accumulated ICT application experience is necessary. This has to become a part of school (and university) life. As ICT specialists think about possibilities in the nearest future to communicate with computers as with people (Web 3.0), so educators have to constantly think how to apply existing ICT so, that a maximum educational (teaching, educating, training) result would be achieved. Technological educators were not the centre of attention, are not and don't have to be. The centre of attention is a man and his universal education – preparation to be a Man.

REFERENCES

Bennett, N., Sandore, B., Miller, P. (2001). *Enabling real collaboration through virtual tools: The teaching with digital content consortium experience*. Presentation at MCN/ CIMI 2001, Real Life: Virtual Experiences: New Connections for Museum Visitors.

Bregant, J., Aberšek, B. (2011). Artificial intelligence versus human talents in learning process. *Problems of Education in the 21st Century*, 37, 38-47.

Dani, D. E., Koenig, K. M. (2008). Technology and reform-based science education. *Theory into Practice*, *47* (3), 204-211.

Digital teaching aids make maths fun (2010). Available on the Internet: http://cordis.europa.eu/ictresults/index.cfm?section=news&tpl=article&ID=91159. (Accessed 09/05/2011).

Greenhow, C., Robelia, B., & Hughes, Joan E. (2009). Learning, teaching, and scholarship in a digital age: Web 2.0 and classroom research: What path should we take now? *Educational Researcher*, *38* (4), 246-259.

Hrbaček, J. (2011). New technologies in education. *Technologia Vzdelavania / Technology of Education*, *6*, 3-8.

Lamanauskas, V., Šlekienė, V., Ragulienė, L., Bilbokaitė, R. (2011). Digital teaching and learning content in natural science education: Pedagogical evaluation. *Acta Universitatis Latviensis / Scientific Papers University of Latvia* (Science and technology education: Trends and main tendencies in the 21st century, Riga, Latvia, November 30 - December 3, 2011), *778*, 129-137.

Lamanauskas, V. (2011). Digital Education: Some Implications. *Journal of Baltic Science Education*, *10* (4), 216-218.

Malach, J., Miko, M. (2004). *Tvorba a užiti didaktickych medii* [Creation and use of didactic media]. Ostrava, 64 p.

Miyata, H., Ishigami, M. (2007). Effects of using digital contents designed for PDA as a teaching aid in an observational learning of planktons for fieldworks on a ship. *Advanced Technology for Learning*, *4* (3), 146-153.

Murai, M., Nakagawa, H., Kobayashi, Y., Iwasaki, K., Matsuno, N., & Iijima, K. (2009). The digital teaching materials are utilized for the science education at a Japanese elementary school. In G. Siemens & C. Fulford (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2009* (pp. 73-78). Chesapeake, VA: AACE.

SCIENCE & TECHNOLOGY EDUCATION

SCIENCE EDUCATION AS A CORE COMPONENT OF EDUCATEDNESS

IT is so interesting and useful to discuss the issues of modern education. Professor A. Broks clearly defines that 'scientific and technical literacy for all and high quality science and technologies education for a coming new generation of specialists is the main task for the corresponding development of general as well as professional modern science and technologies education (Broks, 2007)'. The latter statement can be an argument that teaching science faces problems in the majority of countries. The investigations reveal that in comparison with other subjects, those of science (particularly chemistry) are the most complex and boring ones in comprehensive school.

There are plenty of different scientific research on recent science and technology education carried out across Europe. We need to know the diversity and findings of the conducted investigations in order to more carefully coordinate further research. According to Eurobarometer opinion polls, the EU instrument for the analysis of public opinion, in comparison with the older generation, the younger Europeans generally have a positive attitude towards science and technology. However, less and less students are interested in scientific studies and careers. The fundamental question is addressed to stimulating young people interest in science studies and science in particular. We can state, that crucial to any learning is motivation and interest – perhaps the most valuable thing a science teacher can do is to demonstrate enthusiasm for learning science (Goodwin, 2006). We are clearly targeted at primary and secondary school learners as well as at those studying in colleges and universities. Obviously, more attention in the field of natural science education should be devoted to the preschool age children on the one hand, and to the adults, on the other. The result to which we are expediently aspiring is development of a real and rather strong interest in science. We must intensify the efforts to make natural science education more effective at all levels of education. Due to a huge amount of specific information, natural sciences are very hard to be properly mastered.

Another important argument for improving science education is awareness that scientific knowledge in modern societies is one of the key elements of economic and

social success. In this context, modern science education must be accepted as a bridge between scientific research and society.

In general, European countries have totally different schooling practice and apply a number of specificities in the field of science education. It seems logical to accumulate this experience in order to show links between Western and Eastern traditions in the field of modern science education.

2007
Problems of Education in the 21st Century, 1, 5-6.

SOME IDEAS ABOUT SCIENCE AND TECHNOLOGICAL EDUCATION ACTUALITIES AND PERSPECTIVES

SCIENCE Education (hereafter-SE) actuality in the world is not only not decreasing but on the contrary, it is constantly increasing. As you know, very interesting and contradictory results were received in 2004 having carried out international comparative ROSE research. Once again I'd like to encourage all who are interested in science education actualities and problems to get familiar with already mentioned research. This is also important for the reason that Lithuania didn't take part in this research, therefore we can approximately judge about our position according to the results shown by the pupils of neighboring Latvia. However, these results are not enjoyable because 15 year old pupils' preferences with respect to science disciplines in many aspects are negative. This is a common tendency of so called developed countries. You can find detailed information about this research on http://www.ils.uio.no/english/rose/. There are lots of publications and other interesting material related to research and its perspectives. It is foreseen to carry out a similar research once again this year and to compare the results of 2004 and 2008. It is difficult to predict how the situation will have changed. However, it is obvious that in the last decades the results of pupils' tests in most developed countries are not getting better despite big investments and constant efforts to improve the quality of education. The conception of science education changes, much higher requirements are set for the youth science literacy. In the change of science education understanding the necessity arises to prepare new teaching devices, both traditional devices and the devices which are realized by the help of modern ICT. All this undoubtedly has direct influence on the quality of education. Quality imperative is especially emphasized in the report of UNESCO EFA, 2005. Those who are bringing up youth generation have to be interested in this.

National Lithuanian native language, mathematics, science and social education research of the 4th and 8th form pupils was carried out in 2007. It was found that pupils succeed better in completion of the tasks requiring knowledge presentation. The hardest appear the tasks requiring application of practical abilities. The research also showed that there was not sufficient pupils' research planning and task comple-

tion experience, the abilities of conclusion formulation, measurement device indicator reading, using of various sources of information. Pupils lack deep understanding of phenomena, processes and concepts, application of theoretical knowledge and its relation to practice (Bigeliene, Uginciene, 2008). These results are not surprising, in fact, because in the education process not much attention is given to the formation of practical research abilities. This situation is caused by different reasons, e.g. poor material equipment of science subject rooms (laboratories, appliances, chemicals for doing experiments and so on.) too little time (lessons) is allotted to science subjects, inadequate teachers competence and so on. By making social education significant and sometimes unreasonably integrating the latter with science education the second component remained impoverished. Such pseudo- integration didn't give any positive results as well as unreasonable profiling of teaching in the higher comprehensive school forms. The possibilities of informal education are also quite often used not for the benefit of science education. Here we can mention neighboring Latvians who became seriously concerned about the situation of science education. Science education modernization project on strengthening the material basis of science education has been going on for several years (the leader dr.Dace Namsone). At the moment the project is being carried out in more than 50 pilot schools therefore we hope that the other schools will share the accumulated experience too.

On the international level concern was given to science education textbooks. With the initiative of International Organization for Science and Technology Education (IOSTE) an International meeting on "Critical Analysis of School Science Textbook" was organized in Tunisia, in February, 2007. It was emphasized that every country has a great variety of textbooks from totally traditional textbooks and their appliance to modern approaches. For example, African countries and Malta usually use old British and French textbooks. Only recently new original textbooks started to be prepared (Clement, 2008). Despite the variety in every respect (e.g. the quality of textbooks, supply, their usage and so on) it is stated that science education should be more common, similar because science knowledge is universal and every country is seeking to strengthen so called knowledge society. Scientists from more than 35 countries participated in the above mentioned meeting. A very important attention was paid to such topics given in the textbooks as Sex Education, Health Education, Human Genetics, Human Brain, Ecology and Environmental Education and other. During this seminar the scientists returned to still existing and becoming urgent – the problem that in our textbooks you can still find quite a lot of subject mistakes and old conceptions which are incompatible with modern science education achievements. Without any doubt, we should give much more attention to this problem in Lithuania than we did up to now.

Teacher qualification question remains urgent. The majority of the researches both national and international in one way or another reveal direct link between children's achievements and teachers' competence. Teaching is not a simple thing. On the contrary, the complexity of teaching points out the necessity for deeper research

into the relations between the different elements that constitutes teacher knowledge, and how these are developed and integrated during teacher education (Nilsson, 2008). In this context the suggestion of Lithuanian Education leaders to justify Education law amendments allowing the students of higher schools to work in schools is totally not understandable. This is perhaps J. A. Komenskis times (Lamanauskas, 2008a). According to statistics, there is a lack of science teachers in Lithuanian schools. So called "retrained" pedagogues don't solve the problem. Nevertheless, not a small part of teachers still work without proper qualifications. Therefore, more attention should be paid to teacher training problems. The science teacher training is a very important part for the future quality of science education (Nezvalova, 2007). Not without reason, in recent years a lot of international projects on science teacher training, analysis on competence issues are being carried out. One of them is international project IQST (Improving Quality of Science Teacher Training in European Cooperation). The project results you can find on http://www.iqst.upol.cz. One of the purposes of the project is to analyze science teacher training practice in some European countries and to prepare possible teacher training development mechanisms on the basis of constructivism theory.

The question of using the newest information communication technologies remains problematic. We can't assert that teachers don't use ICT in the teaching process, however, their usage remains inadequate, e.g. inefficiently are used opportunities from the internet in science education (Lamanauskas, Vilkonis, 2006). On the other hand, particularly innovative technologies, such as augmented reality technologies for learning penetrate into schools. Since 2006 international project "ARiSE" has been carried out to reveal the possibilities of augmented reality technology application in education process. You can read about this on http://www.arise-project.org or on Siauliai University Science Education research centre website http://www.gutc.su.lt/ariselt.htm. Application of ICT in science education is inseparable from teaching and learning visualization, implementation of knowledge, perception problems. This sphere should be analyzed in detail, broadening the basis of empiric research. Technologies should not alienate from human being and reality. We should devote all our efforts to stimulating youth interest in science and technologies and reinforcing scientific-technological education at all levels. Although hardly anyone suspects that technologies are having a growing impact on our daily life, however, they are still remain alienated from the major par of society members and policy makers and what is more, frequently stand outside the door of the education system. Hence, opening the door is the obligation of all of us (Lamanauskas, 2008b).

All mentioned problematic questions are in one way or another related to scientific-research pupils' activity in comprehensive school. We can safely assert that especially in primary school practically not an appropriate attention is paid to formation of scientific-research abilities. It is obvious, that modern teaching process is not favorable orientating pupils for scientist (researcher) career. It is very important to analyze

in detail which factors disturb/encourage to train pupils' interest in scientific-research activity. Finally, teacher's competence and also personal interest are very important while forming and developing pupils' scientific research abilities in teaching- learning process. From the managerial point of view, incentive program is necessary for such teachers. The formation of scientific research activity abilities in comprehensive school is undoubtedly, a very important sphere still awaiting of particular attention. Current teaching and learning process has basically changed looking from the paradigmatic point of view. Teaching subjects become the means of realization of learners' demands and interests. Scientific research activity is not an entertainment but a very responsible, thorough work requiring great self- independence. During this activity children's analytic thinking becomes stronger, information search and usage abilities are being developed, they can learn to analyze the accumulated material, make presentations, prepare research reports and so on. It is important to make more pupils interested in this activity. This shouldn't be the privilege of gifted pupils only. However, talking about the developing of scientific research activity at school, several essential questions arise:

- Is it possible to teach every child to perform research activity?
- What to do if a pupil wants to take up scientific research activity but school can't provide elementary conditions for this purpose (for example, there is no equipment, no competent leader and so on.)?
- How to integrate effectively scientific research elements into teaching/ learning content?

Scientific research activity in comprehensive school is undoubtedly a meaningful, integral sphere, however, for developing such kind of activity in Lithuanian comprehensive schools not an adequate attention was paid up to now. Comprehensive school teachers seeking to form scientific research abilities and to develop such activity in the training process face various difficulties: lack of administration support, lack of pupils' motivation, shortage of material and financial resources, etc. Some factors disturbing pupils' interest in scientific research activity in the teaching process are: a) lack of teachers' motivation, b) pupils' orientation to choose an easier, less effort demanding way, c) poor material basis of schools, d) lack of methodology how to organize pupils' scientific research work, e) insufficient teachers' preparation for scientific research work. On the other hand, some essential encouraging factors in the pupils' interest in scientific research activity are such: a) teacher's personality and activity, b) pupils' curiosity, their wish to develop knowledge, to show themselves, c) pupil's abilities, d) different teaching subjects' pupils scientific conferences, seminars and other similar arrangements, e) trips, excursions to scientific establishments, meetings with scientists (Lamanauskas, Augienė, 2008).

Recently in Gothenburg (Sweden) one week course took place for PhD students in science education sphere (Goteborg University, November 16th - November 21st, 2008). The subject of the course was 'The Role of Theory in Science Education'.

The focus of the course was on the role of theory in developing doctoral theses in the context of science education. The event took place according to a common project of Baltic and Scandinavian countries 'NordForsk'. During the course the students presented their researches, shared experiences, listened to interesting lectures, such as: 'Theoretical perspectives on science learning: an overview' (P. Scott), 'Science learning in a socio-cultural perspective' (R.Saljo), 'Theory: who needs it?' (J. Donnelly), 'Appeal to reason, appeal of reason: fostering argument in science education' (S. Erduran) etc. Students' presented works were interesting as well. Their subjects are various indeed, e.g. 'Personalized learning for the most able learners in science' (B.Knutsen, Norway), 'A design-based research on motivation: learning materials with science inquiry' (A.Loukomies, Finland), 'The development of science achievement motivation in Iceland: longitudinal quantitative study based on social cognitive theory' (K.K.Stefansson, Island), 'Establishing learning demands about biological evolution-exploring the constituents, actors and communicative processes' (C.Olander, Sweden), 'Science education outdoors-effects and attitudes' (E.Fagerstam, Sweden) etc. In general, the importance of such courses can be evaluated as a positive contribution into training of young generation of scientists and as an obvious contribution into science education development. However, after analyzing at least minimally the works of doctorates becomes evident that the latter are ready to choose a rather pragmatic and simple way. I mean, such spheres of researches are chosen which are popular at the moment. The great majority of the works are linked to motivation, interests, attitudes and so on. We can't assert that this is not important. In fact, this is the sphere of psychology. However difficult it were to find out the reasons for low interest to science and technologies, the fallen prestige of sciences in comprehensive schools, nevertheless, they are not essential things from the educational point of view. All the more, inquiry based researches give only a panoramic view of the situation, i.e. have a stated character. It is completely not clear or almost not clear what causes such a situation. The main goal of educators is to change, develop teaching-learning process using educational devices. Already mentioned ROSE research revealed that pupils understand the meaning of sciences and technologies to society in general, but they are not satisfied with school science. It is obvious, that we come in touch with deeper didactic problems here, for example, the content of teaching, teaching-learning methods, teacher and pupils relations, scientific research activity (the latter is a very important part of the whole science education process), at last, teaching-learning process management in general. If we concentrate only on psychological parameters (interests, motives, demands, attitudes and so on), essential didactic parameters remain outside. In other words, the essential question – effective pedagogization of the whole science and technological education process hasn't been solved yet (it considerably deviated towards psychologization and sociologization). Such conclusion can be made from the experience acquired during the course in Gothenburg.

The actualities of science education discussed in this article make one take up

research, analytic, expert job. There are no drawn limits for the development of science education. More serious theorists and practitioners efforts are simply necessary. There is a hope that this issue remains one of the main science education efficiency catalysts not only in Lithuania but also in the international arena.

2008
Problems of Education in the 21st Century, 9, 5-8

SOME IDEAS ABOUT SPECIFICITY AND METHODS OF FOSTERING VALUE-BASED RELATIONS WITH NATURE

THE interpretation of the concept *'value'* is extremely varied and brings a historic background. Values are fostered since childhood through the process of sharing and analysing individual experience based on certain concepts such as goodness, beauty, love, etc. Rules and standards are also important for value development. All people tend to seek values and their cognition ("When Values Change", 1999). 'The Dictionary of Psychology' explains that value attitudes as if determine all human works, the main patterns of behaviour, different actions or even a single act (The Dictionary of Psychology, 1993).

The issues of moral values are highly relevant as they are closely related with the human upbringing, fostering of his value attitudes (The Sketches of Ethics, 1984). Secondly, modern education is in a state of global crisis partially because of the absence of a value-based design of its strategic functions (Sankar, 2004). The development of value-based attitudes is a complex process. In general, morality or moral is the most conservative aspect of inner culture, it changes slowly and gradually. However, children and teenagers have less preconceived ideas and habits than adults. Therefore, their relation with the world is in the making, they are more flexible and susceptible to outward influences (Gurevičiūtė, Galkutė, etc. 1997). J.Piaget is sure that the middle childhood (the age of 6-11 years old) is the most suitable period to foster moral issues. L. Kohlberg referring to various research points out three stages in the evolution of morality. The second stage includes children aged from 10 to 13 and is called *the self-decided moral agency*. The third stage represents the moral agency using all individual moral standards. This kind of morality develops or fails to develop in the period of adolescence (Kliminskienė, 1999).

The tutors who attempt to develop respect for nature in the values of their pupils should know and utilize the mentioned peculiarities of the age boundaries. Primary school shares a great responsibility in this process while pupils are curious, sensitive to nature, influenced by the processes of the outward world at this age range (Atutienė, 1999).

Love for nature, the importance of its protection should be instilled since childhood. Experience acquired in the family is further developed at school where value-based attitudes are continually established, a strong individual opinion about the surrounding nature is developed. These considerations presented by Kliminskienė and Kliminskas (1998), Vaitkevičius (2000), Šapokienė (1998), Gajauskaitė (1990), etc. have become extremely important having assessed the data of recent research. The survey of parents conducted by Miltenienė and Mockevičienė indicates that only 36% of the applicants indicates that they taught their children to love nature, involved children into practical tasks: to perceive the world of nature, to take care about animals, 44% of the parents admitted that they paid little attention to the above mentioned factors or agreed they did not pay any attention as they supposed their child would gain this knowledge at school. 20% of the parents stated it was not the main goal of their family. Most of the researchers agree that very often the media ignore the development of positive value-based attitudes and impose many things without any value-based orientation. Hence, in respect of nature, school is mainly responsible for the fostering the value attitudes of the pupils (Miltenienė, Mockevičienė, 1998). Since 1998, active enthusiasts have launched a project "The Animate World and Me" which involves the city pupils who have pets (Bobrova, 2000). L.Bobrova states that the curriculum of this project developing children's care for their animals is one of the most effective pedagogic and psychologic methods that builds up mental, emotional and physical well-being of schoolchildren, enriches their free time trying to reach harmony with nature (p.10).

Research carried out in Russia revealed that actually half of the primary school essays reflect a pragmatic relation with nature, 'Nature is our greatest treasure', 'Forests must be protected because pencils and rulers are made of wood', 'Dogs are important because they guard houses', etc. Such pragmatism of the primary schoolchildren is nothing but a result of the pragmatic content of comprehensive educational school. Children simply repeat the clichés mentioned by their teachers (Jasvin, 2000). Most probably, a similar situation can be found in Lithuanian schools (though not enough research have been carried out). In conclusion, it can be said that contemporary school is not yet ready to perceive and instil the shallowness of consumerism (Uktveris, 1997).

Having reviewed the positions of various authors on the issue of the development of value-based attitudes in respect of nature in comprehensive schools, the following conclusion can be made in diagram form:

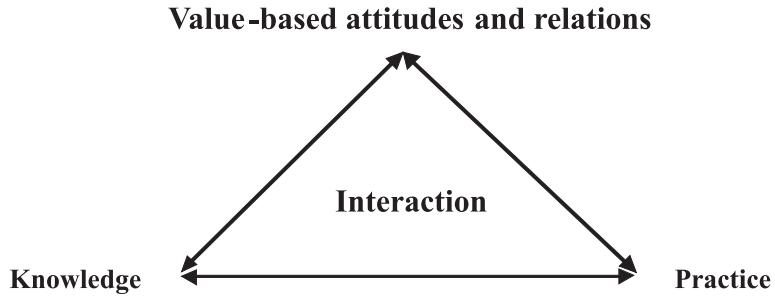

Figure 1. The development of value-based attitudes in respect of nature

The diagram demonstrates that the development of value-based attitudes is non-effective without knowledge and practice. Symbolically it looks as an exclusive triangle. The interaction between knowledge and value-based attitudes is rather complex. Value-based attitudes are certainly affected by the knowledge gained during the learning process. However, on the other hand, the settled attitudes often hinder people to accept the knowledge which may seem inappropriate. Gained knowledge itself does not change the behaviour of schoolchildren. In order to introduce changes, value-based attitudes must be altered, i.e. individual opinion on what is valuable and what is not, what is right and what is wrong, etc. The crucial aim of school work is to impart required knowledge concerning human life, nature and its protection from the ecology point of view. Schoolchildren should know exactly what they do, how to behave oneself in the surrounding nature, how to make moral decisions (Lekevičius, 1997).

Moreover, it is important for pupils to acquire knowledge not only from literature or textbooks, but also from the active practical work at school (Lamanauskas, 2003). It is necessary to teach children to observe and perceive natural phenomena, to pick herbs, to protect animals and birds, etc. According to V.Bernotas, such important practical activities help to foster pupils‘morality, honesty and other valuable personal qualities (Bernotas, 1999). Only interaction with nature, observation and research can help children to perceive, cherish and love it, to shape an active position in regard to nature (Lukavičienė, Urbonavičienė, 1999).

Therefore, developing value-based attitudes in respect of nature in the hearts of children is a long and complex process requiring an absolutely necessary aspect - continuous contact with animate nature. Moreover, without a direct contact with nature, the ability to perceive different forms of life in practice the process will be non-effective. This issue is extremely urgent and relevant in city-life where a child’s interaction with animate nature is restricted to the minimum (Kliminskienė, 1997).

Motiejūnienė, Makarskaitė, Bučiuvienė and many other authors emphasise a more frequent interaction with nature and untraditional methods and forms in the development of value-based relations with nature. Obelevičius states that a picture of planting a sapling will not affect the child very much. However, if all children plant

one sapling outside the classroom, the effect will be different. In the first case a child will obtain only theoretic knowledge and very soon forget about it. The other case provides a real life experience that has an educational effect. Thus, having planted a tree, a child will not dare to hurt it and will always remember this experience. The author believes that it is worth postponing a few theoretic classes for such an effect (Obelevičius, 1995).

Galkutė, Gurevičiūtė (1997) and other authors believe in direct and straightforward measures of fostering human and environmental moral values, such as *prohibitions, preachments and morals*. In critical situations they can be effective. However, their frequent use may produce an opposite effect. Moreover, very often a senior student does not have full trust in their teachers. According to the authors, indirect methods are more effective and are called *a silent strateg***y**. This strategy is based on the following principle: we can and have to create such conditions which would automatically develop morality in the soul of the child. However, we shouldn't instil it by force. The purpose of child training is to help children to discover their own values themselves (Motiejūnienė, Lekevičius, 1997).

Kliminskienė concluding the methods, attitudes and possibilities to develop due respect for life and nature states that a positive emotional and valuable relation with nature will be developed only if we continually correlate with nature: perceive, observe, protect, understand it. Only the wide diversity of living nature forms will let us perceive its majesty and divine perfection. Only care for pets, help for the suffering and wounded creatures, sympathy for others can change a passive feeling into an inner revolution, into a conscious act of goodness, into a motivation to be active, into a desire to change oneself (Kliminskienė, 1997).

The revision of modern scientific information sources maintains that little attention is paid to the aspect of fostering value-based relations with nature as not enough research in the field has been carried out. Also it is important to elaborate the most appropriate model of fostering value-based relations with nature. All these questions are mostly connected with science education process in comprehensive school. It is important to shift our attention from *fact-based knowledge* to *value-based knowledge* at all educational levels. Science education today should be much more value-based than many years ago. It can not be neutral. It must contain a spiritual dimension. Generally speaking, it is obvious, if we want to improve education of the young generation, the process of fostering value-based relations and sensual perception of nature should be devoted more attention.

2009
Problems of Education in the 21st Century, 10, 5-8

THE IMPORTANCE OF STRENGTHENING OF NATURAL SCIENCE EDUCATION IN A PRIMARY SCHOOL

TO one who understands at least something about education it is obvious that science education in primary school is very important. Every person's education fundament is formed here. It is understandable that children before school already have certain knowledge about nature. Pre-school children have to know about animal, plant life, should have knowledge about objects and phenomena of inanimate nature, perceive the essence and meaning of care works. Research works show that pre-school children's knowledge about nature is not sufficiently exact and exhaustive. We should especially focus on enriching and making the knowledge about animal and plant acclimatization more accurate among 5-7 year old children (Ušeckienė, 2000). On the other hand, it is stated (applying modified Kern test) that in the group of 5-7 year old children cognizing nature and its phenomena an average level of thinking functions and intellect predominates which directly depends on child's mental maturity level and not on child's sex and age (Plytnykienė, 2002). It is very important for this knowledge to be deepened and broadened in primary school, i.e., in the 1st -4th forms. In this case, natural science preparation quality largely depends on the teacher, on his competence in natural science. Since 1992 a new subject "The world science" has been introduced in primary school which can be interpreted as one of the components of natural science education. Currently in Lithuanian primary school science education fundamentals are integrated into the world cognition course. Biology, physics, chemistry, technological, ecological problems make the part of this natural science program. The main nature cognition purpose is to educate children's ability understand the world of nature and communicate with it. So, integration of natural science fundamentals on the one hand and social and natural science components on the other hand will further remain a very meaningful sphere of educational process in primary school.

On the basis of Lithuanian comprehensive school General Programs every teacher can create a detailed and specific world cognition teaching program, compatible with children's interests, maturity level and other personal features. However, this is not an easy task. No matter how much we reform the content of natural science

education in primary school the problem of balancing such content remains unsolved. Going deeper into this content it becomes obvious that biological component predominates. However, the aim of world cognition course is not only natural science education but also education of social abilities and value standards. This especially burdens the quality of natural science process in general. Very often the integration of natural science and social components is mechanical, inconsequent and not systemic. Practicing teachers noticed long ago that world cognition course turns into the direction of social sciences and ethical education (Bučiuvienė, 2007). In General programs it is emphasized that the cognition of social sciences' concepts is not an end in itself. The same can be said about natural science concepts. But the latter haven't been selected up to now. It is not clear yet what related set of concepts it would be good to present to primary school pupils. In other words, there is no clear list of such concepts - especially this can be said about physical and chemical ones. All this remains an urgent didactic problem. The first steps have already been made. The component of the content of chemistry in primary school is being tried to be selected and modeled (Lamanauskas, 2005). Why should we strengthen chemistry component in primary school? The question is not simple and a wide and deep discussion is possible here. First of all, referring to researches (Malinovskaya, 2002; Ševčiuk, 2005) we can claim that the interest of primary school pupils and of the 8th formers in chemistry as a subject is not only not weaker, but very often stronger. Children get very naturally a lot of information from surroundings (home surroundings, multi-media and so on). It is without doubt, that in primary school children can be introduced very widely to chemistry science propedeutics (e.g. the classification of the materials, different chemical combinations and so on). However, the worst situation is with modeling physics component. Physics component is also important ensuring a balanced natural science education in primary school, isn't it? In international practice excellent examples occur about how to strengthen natural science education in primary school. Modern ICT are particularly helpful for this. Various websites have been created where children as well as teachers can find a lot of valuable practical information. For example, ChemiCroc is a very interesting website, the purpose of which is to help children understand the world of chemistry. (http://www.chemicroc.com/index.php?page=1). In Finland the project Chemistry for Primary schools HEUREKA has been prepared and put into practice (Pilot Project: Chemistry for Primary Schools, http://www.xplora.org/ww/en/pub/xplora/nucleus_home/pencil/heureka.htm). A lot of valuable natural science material is given in Australian website (http://www.primaryschool.com.au/science.php).

Another important aspect of primary natural science education is to make the children observe, investigate nature, learn to discern the link between facts and phenomena, feel the integrity of the surrounding world. Children not only like this activity but this activity stimulates their interest in nature and surroundings. Foreign researchers often emphasize this: (English - *pupils want a more hands-on approach)*.

Nature research based on scientific methods and nature research results are linked by the process of *research* – from simple observation to primitive data-processing. Research activities are extremely invaluable for pupils. Moreover, schoolchildren have already got some rudimentary knowledge about natural science from the previous studies at school. According to professor Šapokienė, exploration is "a form of the organization of the educational process, when pupils become familiar with the basic methods of research, learn easily comprehensible elements of research methodology, obtain knowledge and skills to individually investigate phenomena of natural and environmental life" (Šapokienė, 1994). If it is possible, not complicated experiments, tests are carried out; planting and growing; dissolving, steaming; weighing and measuring. The pupils are taught and learn consequent research method: observation- analysis- hypothesis- checking it- conclusion. In primary school the teacher tries to make children observe, investigate nature, try to discern the link between facts and phenomena, their interrelationship, feel the integrity of the world. As Rauckienė states (1994), subjective factors play a great role in the child's cognition of nature: his willingness to find out, his mood and his concrete activity. Observations, demonstrating, tests, laboratory works and other practical research work enrich children's sensual knowledge and cause the creation of image system (Šlekienė, 1999). Later on, problem situations can be created in order pupils could more or less perform the process independently from abstract to concrete and vice versa. Researches show that children's investigation of nature and its phenomena during the organized, inspired and independent activity is dynamic but directly depends on every child's interests, ways to find out, investigate, experiment and share the experiences of the acquired results and their changes (Plytnykienė, 2001). Children like research activities. Researches show that the first formers value especially positively the tasks in their world cognition exercise books (34%), the second form pupils give priority to tests and experiments (30%), the third and fourth form pupils like experiments and tests as well (45% and 42% respectively) (Laurukėnaitė, 2002).

> Teachers themselves are inclined to intensively explain, tell and very often establish the similarities and distinctions of nature bodies, depict their main features, etc. Schoolchildren most frequently stay passive observers, who are provided with a rare opportunity to research, prove, discover…Pupils' knowledge about inanimate nature gained during the classes of world science in primary school is not exhaustive but children's cognitive activities positively influence the quality of their knowledge… (Laurukėnaitė, 2002, p.52).

Insufficient attention to natural science research activity is one of the reasons why "World science" lessons are not liked by pupils. This can have influence on further natural science education in secondary school. Children's accumulated personal experience, social and other abilities are too poor to enable them find out and perceive complicated nature phenomena on their own (e.g. a child can't understand why it is

getting dark quicker in the forest; why a broken/cut tree can't grow again and so on). Pedagogue has to become a helper in child's way to cognition – not to answer the questions, but help him find correct answers to the questions he is concerned about (Kisieliūtė, 2002). So, the strengthening of natural science process in primary school is a very important trend of improvement. This requires methodological support for teachers organizing constant professional development in this sphere. It is also clear that children are interested in the science classes when the content of the taught material is comprehensible, attracts attention and imagination, encourages to intensively work and is problematic (Lamanauskas, 2003).

It is worth emphasizing, that world cognition is not only the course realizing natural science – social education. It comprises ecological, environmental, healthy way of living and other components as well. Generally speaking, the question is how to integrate effectively harmonious development ideas into educational process. Here, again didactic assistance is necessary for teachers, especially those, who are interested in this sphere, are accumulating experience and trying to convey it to others. As an example we can mention the experience of teacher R.Ragaliauskienė (2004). The author shares methodical experience of how to develop environmentally friendly way of living, how to form value standards at school, providing knowledge on ecological and environmental issues, developing abilities and skills in this sphere.

I'd think that an actual question is of taking over and sequence. In this editorial there are no possibilities to analyze these problems in detail however, it is necessary to pay attention to them. We have already mentioned that natural science education in primary school is only one segment in child's life, in the formation of his personality, in the structure of education formation. Obviously children bring some kind of natural science education from their family and pre-school education institution. This is an important foundation for further growth of this sphere of education. The question which is more and more frequently formed by psychologists is as follows: is the child coming to the first class of primary school not already tired of teaching? In other words, does pre-school teaching not duplicate school teaching? According to the latest researches, the problem of taking over is very important. If cognitive, creative and relation components are joined into entire system one can speak about effective natural science education process and its taking over in the system "pre-school education institution – primary school" (Anikudimova, 2004). Moreover, natural science education in primary school shouldn't be fragmentary, though in many aspects it is exactly like that in nowadays Lithuanian primary school. As a problem example can be given that frequently life and development questions of living organisms are analyzed separately from physicochemical environment factors and also from physicochemical processes going on inside these organisms.

It is obvious, in order to understand the peculiarities of natural science education working with junior pupils exhaustive researches are necessary and natural science education in primary school has to be modeled, corrected and developed on their

basis (Lamanauskas, 2005). Only high-quality natural science education acquired in primary school can guarantee proper continuation of natural science education in basic and secondary school.

2009
Problems of Education in the 21st Century, 11, 5-8

INTEGRATED SCIENCE TEACHING BY APPLYING DIDACTIC DIFFERENTIATION: SOME ACTUAL CIRCUMSTANCES

THE discussion about integration cannot dispense with antithesis (differentiation) which is also of high importance. The default of it is a fairly serious lack of comprehensive school. Both processes have to follow each other as this is the most plausible way of human understanding and knowledge improvement (Vaitkevičius, 1979).

A public knowledge is always wider than personal information. Ipso facto human cognition and public experience are not differentiated.

Teaching constricted by undivided educational drafts and curricula frequently ignored personal schoolchildren's qualities. Pupils unable to satisfactorily adopt teaching material are overloaded while others state that such load is insufficient. This is why a general background of a number of learners recedes and the motivation of all pupils decreases.

Research indicates that genetically all people differ. Genetic inequality most frequently determines the child's abilities. Natural differences are highlighted by a different situation of upbringing and an environment.

Teaching differentiation is not a new issue of pedagogy but a traditional one. J.A. Komenskij was one of the formers to promote an idea of differentiated teaching. In his work "The Great Didactics" the author offered to take into consideration different schoolchildren's abilities and other personal features and advised to subdivide them into groups. The foundations of differentiated schoolchildren's teaching were laid by the psychologists V.Stern and E.Clapared. Manhaim schooling system carried out an extensive investigation in the field. The deep-rooted traditions of differentiated teaching survive in other countries such as Great Britain, the USA, France.

Differentiated teaching in Lithuania has native traditions. Differentiated education was a field of interest to Lithuanian philosophers and pedagogues such as A. Maceina, S. Šalkauskis etc. A marvellous job in the field was done by J. Laužikas. The problems of differentiation become burning again. Some questions of differentiated education (teaching) were investigated by J. Vaitkevičius (1985), N. Večkienė (1991), L. Šiaučiukėnienė (1996; 2001), A. Budėnas (1991) etc. In many scientific information

sources we can find a lot of different terms which are used to express the idea of differentiated teaching, for example, individual teaching, personalized teaching, differentiating instruction etc. It is possible to underline that differentiating instruction, for example, is one of the most applied methodologies in teaching nowadays (Tsavkova, 2009). The main problematic question still now is how to design personalized learning for every student. We can agree with opinion of C. A.Tomlinson that students may learn in many ways, the essential skills and content they learn can remain steady and students can take different roads to the same destination (Tomlinson, 1999).

The method of didactic differentiation is rather complex. The teacher should not forget that every child (pupil) needs the best conditions attached to develop his/her abilities when combining unlike work patterns at school. "Every schoolchild needs suitable conditions to be laid down in order to elaborate his/her intellectual inner world. Individual perennial help and encouragement to seek perfection accordingly to the personal programme, the achievement of more freedom to act, to learn, to show not to kill originality are considered to be very helpful features" (Vaitkevičius, 1988. The proportion of integrated to differentiated teaching is also very relevant from a methodological point of view. It can be defined as a system of two contradictory tendencies (Lamanauskas, 1999).

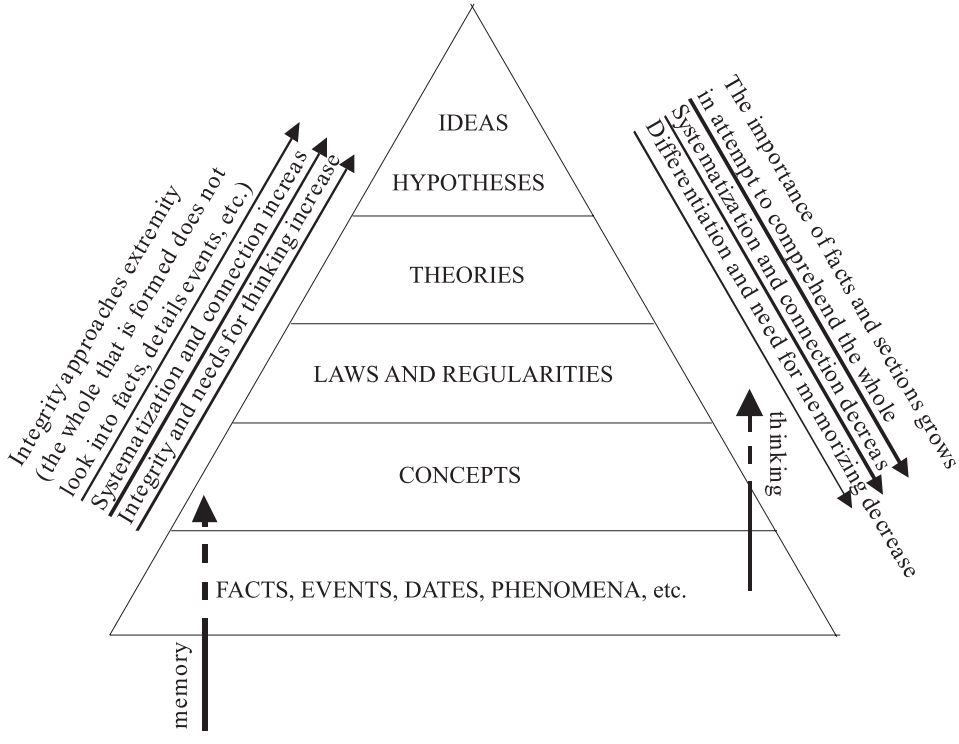
IDEAS
HYPOTHESES
THEORIES
LAWS AND REGULARITIES
CONCEPTS
FACTS, EVENTS, DATES, PHENOMENA, etc.
memory
thinking
Integrity approaches extremity (the whole that is formed does not look into facts, details events, etc.)
Systematization and connection increas
Integrity and needs for thinking increase
The importance of facts and sections grows in attempt to comprehend the whole
Systematization and connection decreas
Differentiation and need for memorizing decrease

Figure 2. The relation between integrated and differentiated teachings

Preventive and polyreasoned discretion lies dormant as a dialectic conservation mechanism of natural complexes is hidden here. Though, to some extent, it is suitable for public processes. Natural and public laws work together in training practice. The teachers that grasped this mysterious phenomenon will easily succeed in integrated pedagogy practice. The balance between integration and differentiation is more than necessity.

Didactic differentiation of the class is a kind of teaching when schoolchildren in the classroom are subdivided into the groups agreeably to certain features. Pedagogy literature suggests various definitions. Some authors (Šiaučiukėnienė, 1996; Lukšienė, 1994 etc.) call such differentiation *intrinsic*. L. Šiaučiukėnienė believes that intrinsic differentiation discloses group work that is organized in the classroom. The diversity of pupils' didactic objectives and the specificity of the subject are considered. Other authors (Laužikas, 1974; Gražys, 1977; Simanonis, 1969; Simonova, 1974; Lamanauskas, 2001 etc.) call intrinsic differentiation *didactic* (the term is used to stress its goal and place in the educational process). J. Laužikas supposes that, "the distribution of schoolchildren into groups should follow the next main criteria: learners' knowledge, skills, efficiency and the approach to learning". Nevertheless, there are some doubts if these criteria are sufficient as the psychologic moments of subdivision into groups are not mentioned at all. The training process has to accept all personal features of the child's psychology: ability to concentrate and transfer attention, the type and level of memory, the rate of thinking, feelings, nervous type, etc. The children with slow-going and rapid thinking often demonstrate the same abilities. The only difference is that the latter need more time to adopt the teaching material. Schoolchildren vary in using their strength of mind in unlike situations. The strength of mind alterates, grows, increases along the acquisition of the latest information. Considering their potency of cognition, students' distribution into groups is not appropriate because of two main reasons:

- it is based on a certain teacher's approach and evaluation and often on the dictate;
- the child is not always self-sufficient as s/he frequently simply submits to the intentions and decisions of other personalities.

Teaching material is imparted insomuch that all learners should be offered suitable opportunities to develop skills during the class. The objective can be reached by maximum solidification of the child's self-sufficiency and his/her personal free choice to learn what, how and how much s/he wants. Raising distinctive claims to all pupils, information should be given expediently and definitely. All schoolchildren should achieve at least minimum level (should get satisfactory evaluation) and all willing, engaged and skilful pupils could reach much more. The system of evaluation is not important (a five point, ten point etc. system). One purpose is clear – it also should be differentiated.

According to J. Bruner (1966), every child wants to learn but a need is stifled by the schooling system (inflexible, obsolete teaching methods and forms, etc.). Re-

search carried out by N. Proskurina indicates that 23% of pupils do not understand the purpose of the tasks accomplished in the classroom, 30% of those do not think what the purpose of the tasks is (Proskurina, 1986). Other investigations (Pukelis, 1989) confirm that only 3.3% of the teachers of comprehensive secondary school niggle over the issues of differentiated teaching.

Every child, certainly, learns personally, i.e. according to his/her model. The range of an individual approach to the child is very extensive and involves a number of characteristic features. Didactic differentiation has to shorten the distance between the knowledge perspectively gained by the child (obtained in the classroom) and the information that can be reproduced.

Natural sciences are specific. Thus, endless possibilities rise to employ didactic differentiation that is applied to reveal personal pupils' qualities; self-reliance is encouraged, learning motivation increases, i.e. schoolchildren are oriented towards success.

The application of didactic differentiation creates favourable circumstances to implement the key principles of didactics: scientism (schoolchildren with different interests at varying level soak up the content of teaching), the personalization of the teaching process (an individual teacher's approach to learners as to the subjects and personalities of activity), conscious and active knowledge acquisition (pupils' activity, individual work as the basis of creativity), pragmatism (theoretic conclusions and generalization are reached through personal practice because the investigations show that schoolchildren better acquire knowledge if started from specific and proceed to more abstract) and other principles.

Individual teaching is given preference in contemporary education. The concepts of individualization and differentiation are unlikely treated by the sources but do not finally disclose their essence.

Individualization, certainly, is not and cannot be absolute. Nevertheless, we should bear in mind that the whole class rather than a single person was predominating in Lithuanian schools in the second half of the 20th century. Rivalry stopped versatile human education. Personal abilities and potential opportunities practically were not considered. It's scarcely surprising that a negative pupils' approach to learning and teachers formed, they consciously started skipping classes.

The assessment of pedagogy literature commonly reveals dissatisfaction with ordinary (classic) classes and standard principles of work. The individualization of teaching is the necessity as a pupil needs to be offered an opportunity to accomplish the tasks that answer his/her personal skills and interests, to choose the teaching methods and a style that satisfy the learner's temperament. The schoolchild has to safely go forward (Gage, Berliner, 1994). The examination of the issues of differentiated teaching should not be directed towards one of the forms. The experience of foreign schools (for example, the United States, Germany, etc.) indicates that none of the forms of differentiation (for example, didactic differentiation) is optimal. A proper way is ac-

claimed to be the combination of teaching forms considering pupils' abilities, interests, aptitudes, natural qualities.

The application of didactic differentiation primarily appears as the question of schoolchildren's distribution into groups because the differentiation of teaching most frequently is grasped as pupils' grouping agreeably to certain criteria (abilities, attitudes, interests, intellect). The majority of the Lithuanian teachers recommend students' distribution into groups (Bajorienė, 1976; Jovaiša, Vaitkevičius, 1989, etc.). Nevertheless, a major part of the teachers of foreign countries are against such actions and call it social discrimination (Unt, 1990; Gozzer, 1991 etc.). M. Lukšienė supposes that learners cannot be evaluated according to social, property, cultural, health and other features (Lukšienė, 1994).

Correct methodology is important to the successful didactic differentiation of the educational process. Teaching methodology based on possible differentiated tasks moves liveliness, encourages individual work (Šiaučiukėnienė, 1994). Didactic differentiation gives a child a chance of choosing the level of learning in the light of content, form, etc. at school as well as at home. Opportunities to decide on the tasks of an appropriate level are meaningful to the pupil. The teacher is only an adviser and helper.

Some authors (Gilbuch, 1991; Kondratenko, 1991, etc.) are certain that a free choice is not possible in the employment of didactic differentiation as intellect, abilities and skills develop only when a child is actively mentally involved, i.e. learns very intensively. Moreover, such differentiation should not be a right decision in terms of the schoolchildren that want and are able to work harder. M.Levina, V.Zagviazinskij (1968) pays much attention to the coordination of differentiated and group work in the classroom and supports the idea of categoric pupils' distribution into groups. There are authors maintaining that students' distribution into groups is comparatively a very mild form of differentiation (Mikalajūnas, 1993).

A.Būdėnas supposes that natural child's development is differentiated and experiences a public way of life, world outlook and customs. This is the way to integrated children's personal qualities as well as psychic processes. Thus, personal students' qualities should not be unified and levelled. Didactic differentiation needs more diverse methods. Teaching material should be expanded into parts (for example, pre-programmed algorithms) (Budėnas, 1991). Scant attention turned to the differentiation and individualization of teaching is often one of the reasons of slow progress (Meškauskaitė, 1977). S. Molis also emphasizes the importance of individual tasks in the educational process. Roganovskij (1991) has analysed the issues of differentiated teaching and focused on the textbook of the subject. V. Monachov and V. Orlov (1990) stress different teaching in the classroom: distinctive tempo, the unequal help of the teacher, the diversity of tasks. They also suggest grouping of schoolchildren. I.Leons (1991) concentrates on the relevance of the individualization of teaching. He believes that the efficiency of suchlike teaching depends on a particular methodology that guaranties the possibilities of didactic differentiation in

the classes of natural sciences. However, thorough individualized assistance has to be warranted.

Similar problems have been debated by other researchers. J.Ots (1975) researched the efficiency of individualization and established that the individualization of tasks made pupil active and generated interest in the teaching subject. The author distinguishes the systems of the tasks of three levels and approve learners' distribution into groups. A.Zeidmane (2000) finds four types of differentiation: differentiation by outcome, differentiation by task, differentiation by process, and differentiation by response. However, the author notices that all types have advantages and drawbacks.

Hence, the summary of experience and recommendations of the majority of the scientists that have examined the issues of differentiation confirms that didactic differentiation has to be wider employed in the classroom. Classes have to pay respect to the differences of pupils' learning pace, unlike psycho physiologic characteristics (imagination, unequal inquisition, learning interests and motives, distinct thinking, workability, the degree of consciousness, etc.), learning motives, interests, aptitudes, etc. at deviant level. Didactic differentiation can be expressed in diversiform ways in the class:

- applying tasks and exercises at different level in dissimilar pupils' learning activities;
- orientating schoolchildren towards various activities (practice, creative, theoretic, draft producing, etc.);
- suggesting teacher's help at different level, etc.

The employment of the integrated course of natural sciences reveals plenty of opportunities of the differentiation of didactic teaching. The tasks at three levels are recommended to be assigned to students. The tasks at level 1 (satisfactory) agree with the requirements of nominal curriculum (standards). The tasks at level 2 are supposed to be suitable for the learners of moderate abilities. The tasks at level 3 are the most complex and require more knowledge and deeper thinking. The assignments are considered to be differentiated in terms of complexity (content size) and the format of activities. Pupils themselves need to be provided a chance to choose the level of tasks. It prompts schoolchildren to evaluate their strength, teaches to act self-sufficiently, broadens and extends their knowledge, sets out conditions to diverse activities. Undifferentiated and impersonalized individual tasks usually are not effective.

Thus, individual and differentiate teaching agreeably to abilities shows that pupils are taught to act self-sufficiently and in groups (Laužikas, 1982). Prof. Laužikas assumes that the most important point is children's protection from failure and unpleasant experience accomplishing school tasks (Laužikas, 1982). The majority of researchers agree that an intense activity is only possible in case of differentiated or individual work.

If one of the objectives of integrated education is a help to the learner of the present to be oriented towards the abundance of information and materialistic-technical

valuables, to prevent a child from becoming an immoderate consumer, the key objective of differentiated education (teaching) is the establishment of perfect conditions and opportunities for every child, including weak and bright students, to be trained physically and mentally. Therefore, the implication of the integrated courses of natural sciences into educational process should not ignore the ideas of differentiated education (teaching).

The application of the mechanism of didactic differentiation can be effective seeking the following goals in forms 5 to 9 of basic school:

- to promote learning;
- to develop a free, responsible, able to resole, self-sufficient personality;
- to foster interests and aptitudes;
- to increase the knowledge of the area chosen by the child;
- to stimulate creativity;
- to broaden schoolchildren's professional orientation, etc.

Every teacher understands that pupils could achieve much more in the classroom if offered appropriate conditions such as the atmosphere of self-sufficiency, the freedom of action (choice), a lesser dimension of frontal work in the class and a larger amount of individual tasks. In terms of a pedagogic process, individual work with students is a pedagogy action considering the development level of a learner, the obtained knowledge of world science, individual psychic characteristics, the previous methods of training and teaching, life structure, the present situation, a dynamic stereotype and instantaneous psychic state established in the educational process and life (Laužikas, 1974). Laužikas distinguishes three main propositions in his assessment of the pedagogic-psychologic aspects of differentiated teaching: 1) to know pupil's personal values; 2) to own suitable sources and material for individual and self-sufficient stimulation of schoolchildren's activities; 3) individual forms of activities. Laužikas strongly emphasizes a psychic activity. He maintains that only an active pupil can properly develop his/her abilities (Laužikas, 1965). The recent research indicates that the schoolchildren aged from 7 to 10 cannot completely express themselves. A. Golubeva, S. Iziumova, M. Kabardov and others (1991) are convinced that:

- students' aptitudes and interests frequently disagree with their skills. Skills and aptitudes sometimes are indifferentiated;
- the possible inborn preconditions of skills and aptitudes are hidden from teachers, parents and learners themselves;
- side effects, for example, devotion to teachers and classmates or school prestige are sometimes more significant than a need to apply his/her innate skills

Thus, according to the researchers, it is essential to perceive how realistic pupils' psycho physiologic abilities, skills, aptitudes should be reflected in the educational process at different age range. Therefore, the criteria of the usage of didactic differentiation in the educational process should be defined. The authors declare that

permanent individual psycho physiologic and psychologic guidance is important to the student but does not come up with suggestions for practical implementation.

I.Jakimanskaja, G.Abramova and others (1991) assume that the mechanism of didactic differentiation has to be warranted by the wholeness of specific didactic means: educational tests, the systems of tasks and exercises, individual work, tests, etc. These means should be prepared agreeably to the basic consistent patterns of psychology and should try to seek the ensuing goals:

- to reveal the result of teaching ("learning", "completion", "employing", etc.) as well as the process of achieving the result;
- to check the stability of methods applied in teaching.
- Laužikas suggests that didactic differentiation:
- allows children to be grouped rapidly and flexibly considering varied psychic qualities and the level of knowledge;
- affords to encourage and assign self-sufficient work to pupils;
- establishes suitable conditions for a teacher to teach a smaller group;
- helps to increase general activity.

Hence, the educational process has to be flexible, to assist everyone, including the weak and the bright student, to individually go forward and to study some subject when the learner feels fit to do it. The final goal is to achieve positive results at the end of teaching/learning as the stages of the latter process are insignificant (Dupont, 1993). When seeking impressive results, two tasks need to be completed:

- an effective system of didactic differentiation in the classes of natural sciences has to be produced;
- more diverse didactically differentiated teaching/learning material of natural science should be prepared (for example, tasks, tests, questionnaires, games, etc.) and the opportunities of practic implementation should be envisaged.

Thus, differentiated tasks encourage a pupil to intensively think (for example, makes an outline of a topic, highlights the key concepts, writes a summary, etc.). A.Smirnov (1966) has proved that schoolchildren absorb the examined material spontaneously when a wish to be active is more important than a desire to remember something. The crucial methods of such an activity are conclusion, specification, classification, comparison and systemization. Consequently, the teacher must be perfectly familiar with didactics and psychology. The present psychologic-didactic research shows that the encyclopaedic knowledge of didactics and psychology is a qualification of rational teaching (Grudenov, 1985). According to Grudenov, the foremost point of the class is that a teacher should be able to create psychologic situations that made all schoolchildren to think more actively, differentiated tasks should foster learners' self-sufficiency and exercise skills of work with different sources.

Differentiated teaching is accepted as a particularly effective method in most of the countries. The differentiation of teaching, the diversity of tasks stimulates cogni-

tive pupils' activity, interest in the subject as well as teaches follow integral links, relate different information into a certain wholeness. Cooperation between a learner and a teacher is widely discussed as it depends on how the teacher works with his/her students, how their self-sufficiency is encouraged, how established conditions influence their activities (Rajeckas, 1994). The results of our experimental research demonstrate that didactic differentiation really positively influences the efficiency of integrated teaching and is benevolent for pupils' differentiated evaluation (Lamanauskas, 1998).

Hence, it is clear that integrated teaching seeks the highest level of knowledge and differentiated teaching points out to every schoolchild. It is obvious, that the main aim of differentiated teaching is to create grounds for the childs structural type of thinking, to form possibilities for a learner to master knowledge according to the degree of abilities (individualized teaching) while teaching separate subjects (subject teaching). The application of differentiated teaching seeks to develop powers of learners. Differentiation can be comprehended and defined in the following two ways: first, as a result of spliting a particular whole into segments, levels etc. or, second, as the formation of new qualitative connections between the separate components of the system due to processes of integration. In the latter case the system acquires a new quality – it becomes more complex. Finally, I want to underline that differentiated teaching (or personalized, individual etc. teaching and learning) is a key component of future teaching/learning process.

2009
Problems of Education in the 21st Century, 13, 5-12

THE COMMON GOAL OF ALL EDUCATORS: HOW TO IMPROVE SCIENCE AND TECHNOLOGY EDUCATION

SCIENCE education is an integral phenomenon that can be grasped as a whole science. Science education plays a very important role in broadening pupils` world outlook. The science classes always discuss real, concrete things and phenomena, which are a part of pupils` reality and even every day life. It is very important that natural sciences should help learners to formulate a clear concept of natural history based on the latest knowledge of the world strongly emphasizing the character of the correlation between nature and society, civilization and culture. The world is multidimensional, and therefore we must strive to acknowledge it. This is a winning goal of contemporary science education (Lamanauskas, 2003).

Science education is playing a crucial role in both developed and developing countries. Quality-based natural science education is necessary for every human living in a modern world. Different investigations show that natural sciences have lost their previous attractiveness in the developed countries. On the contrary, the young generation of the developing countries most frequently has a positive interest in natural sciences. On the other hand, in most of the cases, natural science education in comprehensive school is not popular, inexactly corresponds to the curricula and has no relevance to the learners' needs. The introduced situation is determined by several common and uncommon factors. The process of natural science education in comprehensive school is one of those not adequate for the present day and achievements in sciences. Such inadequacy first of all, has relation with competence of teachers of natural sciences. Insufficient competence is frequently determined by the inappropriate process of studies in universities training prospective teachers of natural sciences.

Another main point is connected with the whole public, not only with young people, but also with adults. Public natural science education (sophistication) is a burning question. Apparently, natural science education is crucial for training the present young generation. In this case, there is no difference whether a young person will be engaged in natural sciences in the future. The increase of interest of those not involved in sciences or having a previously formed negative attitude towards the subjects is a

more complicated problem to be solved. This is concern and obligation of the whole scientific pedagogical society working in the field of natural science education.

Generally speaking, all spheres of science education are important in our modern, technologically oriented society. It is impossible to discuss all pressing questions of science education here. However, I can notice that some trends raise a lot of doubts. For example, the great majority of works are linked to motivation, interests, attitudes and so on. We can't assert that this is not important. In fact, this is the sphere of psychology. How difficult it were to find out the reasons for low interest to science and technologies, the fallen prestige of sciences in comprehensive schools, still they are not essential things from the educational point of view. All the more, inquiry based researches give only a panoramic view of the situation, i.e. have a stated character. It is completely not clear or almost not clear what causes such a situation. The main goal of educators is to change, develop teaching-learning process using educational devices. Some last researches revealed that pupils understand the meaning of sciences and technologies to society in general, but they are not satisfied with school science. The main question till now is why? It is obvious, that we come in touch with deeper didactic problems here, for example, the content of teaching, teaching-learning methods, teacher and pupils relations, scientific research activity (the latter is a very important part of the whole science education process), at last, teaching-learning process management in general. If we concentrate only on psychological parameters (interests, motives, demands, attitudes and so on), essential didactic parameters remain outside. In other words, the essential question – effective pedagogization of the whole science and technological education process hasn't been solved yet (it considerably deviated towards psychologization and sociologization). Researches of a stated character are not sufficient to reach this. In recent years not only in Lithuania but also in academic societies of other countries, it has generally become a norm to carry out different stated (diagnostic) researches. Very rarely researchers try their ideas and theories in practice. Simply there are no possibilities for this. Then, researchers go along the road treaded by sociologists and psychologists i.e., give questionnaires, tests to pupils, students, pedagogues, only strengthening existing educational practice by this (Bitinas, 2006). Thus, there is one more open question how to rationally change existing educational practice in the direction of development. How to achieve that educational researches were much more effective in the practical applicability of their results? As an example we can mention international ROSE (The Relevance of Science Education) research (http://www.ils.uio.no/english/rose/). Countries having participated in the research carried out exhaustive analysis of the results. Different attitude, interest, motive and other differences and similarities in the population of the 15- year old students were discovered. Without any doubt, it is important. However, these results don't have direct influence on educational practice and on the changes of this practice, of course. On the contrary, quite often- different changes occur rather spontaneously.

Another important thing is the role of ICT in education in general and par-

ticularly in science education. It is worth emphasizing, that in recent years, a general degree of integrating ICT in the process of teaching has increased in Lithuania as well as in other countries. The growth is characteristic not only at university level but also at other levels of the education system. It is accepted that ICT makes the process of teaching/learning more effective and beneficial whereas the education system starts functioning faster. The development of ICT and the process of globalization determine alteration in the education system as well as in the whole society. The implementation of new technologies in the educational process raises new possibilities for both teacher and learner, enhances education quality and makes the educational process more versatile.

Therefore, technologies should not alienate from human being and reality. We should devote all our efforts to stimulating youth interest in science and technologies and to reinforcing scientific-technological education at all levels. Although hardly anyone suspects that technologies are having a growing impact on our daily life, however, they still remain alienated from the major part of society members and policy makers and what is more, frequently stand outside the door of the education system. Hence, opening the door is the obligation of all of us. We should discuss and try to solve all key problems really using the ICT in everyday school activities.This is not an easy task. ICT is not as panacea for solving all educational problems. As I have already mentioned, modern ICT definitely play a crucial role in developing the teaching/learning processes at all stages and improving the quality of education. Educational advantages of ICT raise no doubts.

One of the most important requirements for applying ICT and innovative techniques of teaching is a qualified teacher able to professionally use technologies in practice. A modern teacher must know how to employ ICT and adapt them in order to achieve specific goals of teaching. Today we can observe paradoxical situation. In the majority of cases, students` computer literacy remains higher than that of their teachers. Nevertheless, teachers` computer literacy becomes an essential professional work condition. ICT application in teaching/learning process shouldn't be an end in itself. The essential thing is how to achieve that ICT application increased teaching effectiveness, enriched the work of teachers and pupils. Another important thing follows, that it is not enough to use only computers. It is understandable that the majority of modern ICT in one way or another are related to computers. However, not analyzing ICT classification nuances we can notice that ICT variety is necessary to guarantee teaching effectiveness. Not for one country the question arises how to find financial recourses to guarantee such variety. It is obvious, that not the quantity but the variety of technologies is this crucial factor. For example, in the schools of Great Britain active boards are almost in every classroom. "Active boards" are with the software different for primary and secondary schools; "Smart boards" are spread more in the classes and schools of junior and disabled pupils. It is obvious, that constant pedagogues' interest in the newest ICT is necessary, on the one hand and formation of suitable conditions in schools,

on the other hand. It is without doubt, that teacher's pedagogic competence, his ability and interest to use ICT are closely related. The situation in Lithuania comparing with other European countries is not exceptional. For example, in 2006/2007 only 49% of teachers were using ICT for teaching their subject. In 2008/2009 their part increased up to 67% (Masaitis, 2009).

On the other hand, we have different students at school. Their capabilities are so different. This means that modern teaching and learning combines different approaches. It is called "blended learning". Generally speaking, it should be carefully considered because of possible negative outcomes of applying these technologies. Thus, the question of the negative impact of ICT is gaining more weight. It seems no answers are required. On the other hand, we are still suffering from shortage of information on different aspects having negative impact. When the answer is clear, we start feeling lack of required abilities and knowledge of how to reduce the negative impact of ICT or how to eliminate or at least minimize it. Another important issue is what the real impact of modernization on society in terms of ICT implementation is.

Finally, some words about international cooperation. It is undoubtedly an important issue. I cannot imagine nowadays scientific research or scientific activity in general without international cooperation. Science is science and it has international character. Moreover, such cooperation is crucially important for scientists from former Soviet Union countries, because they had no possibility to communicate with colleagues from abroad or such cooperation was strongly limited. Another argument is that science education today is the most dynamic part of the science of education (Toshev, 2008). It is obvious, if we want to obtain the necessary scientific information about different things, to enlarge technological possibilities of societies and so on, generally speaking, to make our world more safe and better, international cooperation among scientists is essential. Only all together we will be able to meet a broad range of global challenges today and tomorrow.

2009
Problems of Education in the 21st Century, 16, 5-7

LEARNERS' INTERACTION WITH NATURE: SOME EDUCATIONAL ISSUES

THEORETIC and empiric research conducted by a number of scientists has indicated that a well-grounded content of teaching and a purposefully planed process of natural science education create opportunities for pupils to better understand an environment, to perceive themselves as active members of the ever-changing world and to take responsibility for the future of our planet. Though there have been plenty of local ecology crises throughout the history of mankind, today we can clearly face a new global ecology crisis approaching. It requires a new organization of the evolutionary process of the world that is the basis for the renovation of the correlation among Human Being, Nature and Society.

Three basic traditions of the correlation with nature have been settled throughout history:

- the West Tradition – the person is called to dominate over a nature and to supervise it;
- the East Tradition – the person aspires to harmony with a nature;
- the Southeast tradition – the person submits to a nature.

Today we are facing a simple but complex question – *which one is the most relevant to a new century.*

The necessity of creating a new morality and ethics under new conditions was raised in the past century. It should have been based on qualitatively new relations between Human Being and Nature. Hence, it could be affirmed that natural science education is a very auspicious field of individual self-expression. On the other hand, investigations have revealed that the problem of natural science education exists. Frequently the pupils' knowledge about nature is shallow, insufficient and ineffective at different age range. Moreover, the reaction of behaviour to the same stimulus highly differ (a child can be aggressive, sadistic, pragmatic, practical, cognitive, aesthetic, ethic and indifferent) even in an equivalent situation (for example, children have noticed a creeping beetle on the path).

> "Any activity, every action of human being is purposefully guided even if we are not able to suitably clearly perceive it. Very often the actions of human being are fated by the processes of sub-consciousness, one of the most important parts of which is a certain result, aim or motive" (Auškelis, 1999).

The task of the teacher is ability to make judgments and predictions of possible behaviour in terms of natural phenomena and to appropriately correct it. It directly relates to motivation which produces human energy and sets the pattern of his/her behaviour and activity. The process of motivation includes the interaction of two characters – a teacher and a learner. Intrinsic motivation of schoolchildren interacts with extrinsic motivation of the teacher.

Figure 3: Interaction of motivation.

Various theories of motivation interpret the same phenomenon rather differently. For example, the behaviouristic approach states that the intrinsic motivation of learning does not exist. However, it should be noticed that children actively investigate various objects of their environment and manipulate them since early childhood. E.Deci (1995) maintains that pupils themselves accept a challenge to become more competent and knowledgeable. Schoolchildren introduce themselves into the educational process rather than passively wait until being involved by someone (p.19-20).

Therefore, striving to make the process of natural science education more effective and to achieve better results, it is not enough to advance the content of education or the juridical documents regulating the process of education. The increase of teacher qualification is an extremely important point. It could be performed only by having assessed professional competence of prospective teachers in order to purposefully develop it (Raven, 1999; Lamanauskas, 2001; Makarskaitė, 2001).

Primary school is a fundamental period in the whole system of comprehensive education. The world of nature is highly relevant for children at junior school age. First, it is a spring of feelings and imagination. The interaction with nature becomes more intensive at this age range. On the other hand, this sort of interaction is not famous for his deep, real or general character (Yasvin, 2000, p.202). The foundation of pupils' natural science literacy comes originally from primary school where the junior pupils study considerably a long time which is a four year period and or even longer. This is the most advantageous period of time to provide propaedeutic natural science knowledge and to form positive affective value-based relations with nature.

The interaction between nature and child has a cognitive implication when the latter accumulates experience, structures it and affords favourable opportunities to develop children's psychic abilities such as senses, perception, imagination, thinking, creativity, etc. For years the school interaction involved only personal observation of nature and the indication of the obtained results in the calendar. The main drawback is that this activity is not purposefully and systematically arranged. Most frequently it is not developed if a child skips a grade.

The primary school teacher is expected to show competence in teaching natural sciences. The fact has been underlined by plenty of researchers. They exceptionally highlight the understanding of modern natural science concepts and ability to respectively make them comprehensible by pupils (Wenham, 1995; Ovens, 2000; etc.). Qualter raises a crucial question which is *How did you get to be a good primary science teacher?* (Qualter, 1999). Research reveals that mere objective information is not enough and that the knowledge of pedagogy is also necessary. The latter includes the content of teaching, curricula, dominance in the classroom, the organization of the educational process and the common knowledge of pupils and value-based aspects of teaching (Shulman, 1987).

The following propositions could be specified:

- effective natural science education does not require conformable psychological substantiation;
- the interaction with nature varies and remains specific within the various periods of life;
- the mission of the teacher is to wisely manage an evolutionary process of the "real" interaction with nature/particularly in primary school;
- an important task of the education system is the framing of the world concept on the basis of the contemporary natural science world view (*natural science concept of the world*). The holistic concept of natural phenomena is a solid core of all levels and stages of the education system.
- all levels of natural science education system (the aspects of teaching content and practical activities) have to guarantee the continuity of formulation the concept of animate and inanimate nature as the whole system;
- individual responsibility of the young generation for the future of our planet is the essential (prior) task of natural science education;
- there is a lack of research intended for the interaction with nature in different periods of ontogenesis in Lithuania.

The question about the typology of the interaction with nature is a complex one. The opinions of the researchers vary. Kalmykov A.A., and Kalmykova A.V. specify four types of the interaction with nature (Kalmykov, 2000; Kalmykova, 2000):

1. Ego-orientated natural centrism.
2. Eco-orientated natural centrism.

3. Ego-orientated anthropocentrism.
4. Eco-orientated anthropocentrism.

Some researchers from the US specify nine types of the interaction with nature (Reiton, 1996; Langenau, 1996):

1. Naturalistic
2. Ecologic
3. Humanistic
4. Moral
5. Scientific
6. Utilitarian
7. Ambitious
8. Negative
9. Aesthetic

According to the results of the introduced scientists, the moral (more than 20 %) and utilitarian (up to 15 %) types of the motivation of the interaction with nature are very clear in the American population. Our results shows that the aesthetic attitude is predominating (37, 1 %). Nature is perceived as a source of beauty. The next agreeably to importance is the pragmatic attitude (28, 4 %). The ethical (16, 6 %) and cognitive (17, 9 %) attitudes are in the weakest position (Lamanauskas, 2003). Following Kavtaradze, the most dangerous phenomenon is that contemporary ecology education is filled with the spirit of pragmatism, because nature protection is accentuated more than that of environment (Kavtaradze, 1990). In this case, individual teacher's motivation of the interaction with nature plays an extremely important role. The teacher transfers his/her knowledge and experience to pupils. Thus, it should be relevant to make ready a scientifically motivated methodology of natural science education process for primary school. It is supposed to rapidly develop a non pragmatic and humane correlation with nature in the process of natural science education. The problem is most frequently connected with the content of education (curricula, textbooks, other sources of information).

The undertaken theoretic assessment of the issue discloses the diverse typology of the motivation of the interaction with nature. It is obvious, that the ignorance of the cognitive interaction with nature (cognitive motivation) reduces the effectiveness and the quality of primary natural science education. It should be acknowledged that the primary school teachers have limited possibilities in the field of contemporary natural science. On the other hand, nature cognition closely correlates with the knowledge of human being and society (Solopov, 1999). In this case, we can appeal to the ideas of the foreign researchers who see necessity to apply the assessment of multidisciplinary natural history and technology problems, to refuse the simple assessment of facts (eliminate teaching of "factoids"), to research (study) the topics and concepts of natural history in the integrated context (Powell and Anderson, 2002) and to strengthen pupils'motivation in terms of natural sciences (Woolnough, 1999; Lamanauskas,

2001).

It is important to make adequate diagnostics of motivation. The diagnostics is obligatory in terms of research. It is hugely important for the building a process of primary natural science education. The correction of the motivation development of the psycho-pedagogical interaction with nature of primary school teachers and students has to be directed towards the intensification of cognitive motivation. On the other hand, the attitudes and motivation are directly interconnected. The attitude can be described as a simple derivative of individual dispositions, as the complete personal readiness to react to the environment impact. Attitudes are one of the most important sources of motivation. In the light of relevancy, the attitude appears as the dispositional motive. In this case, we could discuss the diagnostics of the motivation of the interaction with nature, though attitudes are insufficiently conscious readiness to purposefully react towards the environment impact. On the other hand, the intensification of all motives is important for the educational process. I would like to attract your attention towards the application of the term „motivation". On the one hand, it indicates a personal system of individual motives while on the other hand – the system of the actions directed towards the intensification, correction, etc. of the motivation of the other people. I suppose that the continuous intensification of nature study motives is the underlying function of primary schooling. The motives of nature study should be systematically and continually fostered.

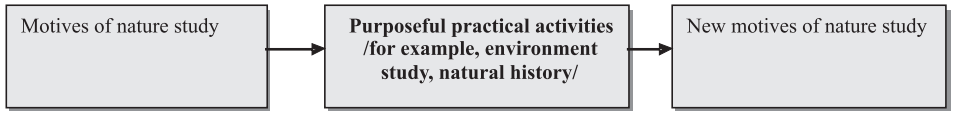
Motives of nature study
Purposeful practical activities /for example, environment study, natural history/
New motives of nature study

Figure 4. The motives: systemic approach.

The child's motives of nature study continually resume, become more advanced and revive individually at higher level. Motivation could be accepted as a productive factor of the internalization of the child's values. Therefore, value-based orientation of the child is increasing and lays down conditions for establishing motives of a higher level. The child's cognitive experience is accumulated through purposeful practical research activities in terms of nature. His/her natural science literacy and the morality of behaviour in nature are broadened and improved. For example, this period, obviously, is very important for the children aged from 9 to 10 as this is the time when moral consciousness of the child is raising. The ten year pupils usually have their individual moral attitudes adopted.

Evidently, the teacher directly influences the evolution of schoolchildren's correlation with nature. Hence, his/her knowledge in the field should be extensive. The process of primary school teacher training should devote close attention to the modules structure and the content of science studies as well as to the methodology of teaching.

For example, the only subjects of ecology are not enough to be included into the curricula of studies. The course in ecology of higher school has to help the prospective teachers to understand general issues about ecology and teach them how the obtained knowledge should be applied to professional activities with pupils (Mironov, 2001). The statement on the global issues about ecology draws a conclusion that reasons are human being and his/her inappropriate behaviour in nature (correlation with nature). However, human being is an object of pedagogy impact. Hence, the correlation between human being and nature can and has to be pedagogically optimized. The modules of studies such as *Natural Science Concept of the Universe, The Holistic Concept of Natural Phenomena, Integrated Primary Natural Science Education, The Pedagogy of Ecology, The Philosophy of Ecology, Bio-ethics, etc*. play an important role. The primary school teachers should be attached conditions to work (certain courses and workshops (a system of ecology training) and to advance a professional qualification from in terms of the correlation with nature. Summer "*Green Camps*" is a very effective form (the length of time is 3 - 5 days). Teachers directly gain and broaden their natural science experience: they participate in natural history activities, learn to observe natural phenomena, get acquainted with the innovations of the methodology of nature and environment observation and experimentation in primary school, launch projects, etc. An individual project is an important component of the camp. Every participant carries out the project in the camp. The camp usually ends with a mini-conference that discusses work results, provides opportunity to share individual experience and outlines the activities of the next school year (Lamanauskas, 2003).

Finally, I want to point out some actual moments. A child faces nature very early, and therefore s/he needs to acknowledge it. We should help children to know it, to make them engaged in the environment they live, to approve their close interaction with natural phenomena and to explain the complexity of natural objects from earliest childhood. After all, it is not enough to say „I love nature". S/he has to admire, feel and confess it. The better a man perceives nature, the stronger becomes his/her correlation with the environment. The man turns into individuality. A human personality cannot progress if isolated from an animate environment. This cohesion should be fostered on the basis of peace from the early days.

2009
Problems of Education in the 21st Century, 17, 5-9

THE COOPERATION OF SCIENCE TEACHERS: SOME RELEVANT ISSUES

NOWADAYS a large discussion is open on the teaching/learning quality issue. It is clear that *"learning is a process of construction in which the students themselves have to be the primary actors"* (von Glasersfeld, 1995). By nowadays the view of the learner has changed from that of a passive recipient of knowledge to that of an active constructor of knowledge. It must be taken into account that *"learning is a process of knowledge construction, not of knowledge recording or absorption"* and *"learning is knowledge-dependent; people use current knowledge to construct new knowledge"* (Anthony, 1996). Having in mind this it is important to promote the active cooperation of science teachers in teaching process.

Collaboration and cooperation (*there are some important differences between these two terms and we prefer to use the second one*) of science teachers are very important components of process of teaching and learning. It is a first step to the constructive, integrated process of teaching. Without adequate cooperation it is not possible to reach the appropriate level of integration, except for internal integration of teaching subjects at a lesson. But in that case a degree of integration is not high enough. Cooperation of science teachers is possibly at all stages of educational process. For example, such cooperation is very effective by preparation of joint teaching/learning programs (curriculum) and concrete plans of activity. Cooperation depends on many factors, for example, the psychological microclimate in collective, motivation of teachers to work better, motivations of pupils and their interest to natural sciences in general. We need teachers to go beyond traditional school science with its emphasis on "key" concepts (Eisenhart, Finkel, & Marion, 1996) and focus also on the processes of learning and thinking about learning (Watters, James, Ginns, Ian, 2000).

Some schools are completely not ready to cooperation and science teachers mostly work individually, not aspiring to find new opportunities. It is obvious that many natural science teacher education programs prepare teachers to teach a particular science subject. From this point of view usually it is difficult for teachers to be involved in fruitful cooperation process in order to improve quality of teaching. Science

teachers` cooperation with primary school teachers also is very important factor for improving of science teaching and learning process. It is effective step for preparation of young students for further learning in secondary school level. The teachers of natural sciences of basic school frequently emphasize that the junior schoolchildren obtain insufficient primary natural science education. Primary school is evidently an essential link of the whole system of general education, and therefore acquired propaedeutic natural science education is weighty (Lamanauskas, 2003). In this case the promotion of cooperative teaching and learning is obviously relevant. All science teachers must agree that:

- it is possible to integrate the knowledge acquired by studying separate subjects (biology, chemistry and physics);
- students can be led into a situation of using their knowledge of different natural sciences simultaneously;
- all external resources need to be found outside the school and involved in common activities (for example, non-governmental organizations, public institutions, libraries, universities, museums etc.).

For effective science teachers collaboration is important:

- to coordinate different programs for all school year;
- to define the basic concepts and terms for each science subject (chemistry, physics, biology, geography etc.), to agree about the general/common interpretation of these terms at different lessons;
- to define the basic contacts/relations of all science subjects;
- to organize different intersubject actions during formal and informal education;
- to involve researchers from different science centres into common activity with students etc.

Nowadays an important way is “Discovery learning”. In this case cooperation of science teachers at school is as guarantor of efficacy of teaching/learning process. “Discovery Learning” requires that the teaching process should be divided into 4 steps (Xu, 2001):

a) design a proper situation according to the content of the course and then explain the problem to be solved in the situation;
b) the students provide possible solutions or hypotheses through various activities;
c) the possible solutions are tested through theories and practice;
d) discover new theories (or new knowledge).

Cooperation among teachers, administrators, a research institute and in-service activities allowed the development of materials which reflect the students’ relationship with nature, promote responsible action, and are sensitive to the cultural aspects of the topic (Riquarts, Henning Hansen, 1998). Educational researchers (Ball, Runquist, 1993; Weinstein et al., 1991) have documented the central and critical role of coop-

eration in helping teachers understand new conceptions of teaching and in developing innovative clasroom practices. Also an important point is that cooperation reduces the isolation of teaching (Brickhouse, Schifter, 1991). One way to overcome this isolation and its pernicious effects is to create cooperative opportunities for professional development and learning during which teachers can obtain information, discuss ideas, classroom experiences and techniques, critique each other`s practices and support each other`s efforts (Hunsaker, Johnson, 1992). The effective forms of cooperation are (Blumenfeld, Krajcik, Marx, Soloway, 1994):

a) work sessions and conversations via telecommunications;
b) structured interviews that probed ideas about teaching and learning;
c) case reports;
d) school visits.

Modern ICT allows new forms of cooperation over time and place, bridging differences and breaking down spatial and temporal barriers. ICT allows teachers in diverse settings to cooperate. It is accepted that ICT makes the process of teaching/learning more effective and beneficial whereas the education system starts functioning faster. The development of ICT and the process of globalization determine alteration in the education system as well as in the whole society. The implementation of new technologies in the educational process raises new possibilities for both teacher and learner, enhances education quality and makes the educational process more versatile (Lamanauskas, 2009).

Teachers need to plan what the program or service will look like (e.g., a peer tutoring program, a co-teaching service, a weekly team meeting), but they also need to prepare for the requirement of working together (Gable, Friend, Laycock, & Hendrickson, 1990).

Finally, I want to point out that cooperation (collaboration) among science teachers undoubtedly raises efficiency of teaching/learning process. It is a first step to the constructive, integrated process of science teaching. Without adequate cooperation it is not possible to reach the appropriate level of integration, except for internal integration of teaching subjects at a lesson. Teachers` cooperation (collaboration) in schools breaks the isolation of the classrooms. Cooperation is an important vehicle through which teachers can plan and carry out an array of services for students. One of the most promising benefits of teachers` cooperation is the increased opportunity it gives teachers to interact with one another regarding different teaching and learning issues. Specifically, teachers who cooperate are more likely to discuss with their colleagues areas of the curriculum they have difficulty teaching. The some more statements on cooperation among science teachers can be mentioned: cooperation has a direct impact on students; cooperation is becoming an essential ingredient in successful schools; cooperation is based on belief in the value of shared decision making, trust, and respect among participants; teachers cooperate only when they share a goal; teachers must make a personal choice to work cooperatively; cooperation is

voluntary, not administratively mandated; each teacher participating in a cooperative effort contributes some type of resource; cooperation can only occur when it is associated with some program or activity that is based on the shared goals of the individuals involved etc. Cooperation with colleagues is helpful way for improvement of professional knowledge of science teachers. So, the need for cooperation is evident in the science education arena in both formal and non-formal situations.

2009
Problems of Education in the 21st Century, 18, 5-7

THE PECULARITIES OF THE EXTRACURRICULAR ACTIVITIES OF PRIMARY NATURAL SCIENCE EDUCATION

The extracurricular activities of natural science education (EANSE) is one of the most significant fields of natural science education. The field hides inside numerous opportunities of choice. Whatever advanced natural science education is – it omits the functions and do not provide the opportunities that could be offered by the EANSE. Teaching is not and cannot be limited only by classes at any stage of the educational system. Pupils gain new experience in the extracurricular activities that is very important to broadening of creativity and other properties relevant to modern life. The usage of the latest information technologies, communication and cooperation, group work, the change of ideas and a critical approach towards social reality are the greatest abilities of human being in a new century. School has to devote an exceptional attitude towards its development. Hence, the system of extracurricular activities should exhaustively be used as this is a place where schoolchildren can acquire knowledge and experience that cannot be obtained at school, i.e. different methods can be applied and the attitude that they are the users of nature as well as responsible for its evolution and protection can be fostered. It should be remembered that an affective value-based aspect is very important to the correlation with nature. It includes a need to feel concern about the environment, to communicate with nature and to feel being an integral part of it (Makarskaitė, 1995).

At the juncture of the 20th - 21st centuries industrial society changed human approaches towards nature. Nature has lost its sacramentalism and magical power. The rapid development of science and technology has settled down the ecology „crisis“. Plenty of negative phenomena in terms of nature have arisen due to unambiguous thinking and aloofness towards environment and nature. The Johannesburg declaration of 4 September 2002 describing balanced development called „From Our Origin to the Future“ emphasizes that the world environment is further devastated. Bio-diversity vanishes, fish resources run lower, more and more loam develops into the desert, fatal climate consequences become evident, natural disasters take place more frequently and lead to severe outcomes, developing countries emerge as more contravened, etc.

To solve the problems, it is necessary to acknowledge nature, to treasure its resources as well as to train human being from the very childhood, to foster his/her positive interaction with nature and its phenomena. The earlier natural culture foundations are built, the better value-based relations between human being and nature are grasped.

A chosen type of extracurricular activities after school quasi extends and complements the class as knowledge is transformed into experience and indicates the possibilities of their practic appliance. According to Prof. Šapokienė, the activity helps to better understand the laws of nature in a real correlation with reality, develops understanding about the wholeness of the native land, encourages the research, observation and environment control, etc. (Šapokienė, 1995). Exceptional attention should be kept to the EANSE research in primary school as this age range is very beneficial to fostering interaction with nature, respect for life and to cherishing other relevant personal properties. However, little research has been conducted in the discussed field. The situation differs in the foreign literature of educology as findings here are the field of interest (Wellington, 1996). A direct link between children‘s interests and the effectiveness of the teacher‘s work including teaching topics of nature in primary school is the object of research (Sullivan, 1979; Dawson, 2000). Designed extracurricular activities of primary natural science education (Osler, 1994), a concept of balanced development in primary school (Summers, 2000; Kruger, 2000 etc.) and other pedagogic phenomena of the EANSE are assessed.

Extracurricular activities are defined rather differently. Despite the diversity of opinions, all authors agree that the extracurricular activities of natural science education are a very important component of the whole educational system. Three ways of extracurricular activities are distinguished in Lithuania:

- formal (centres, sections of the young naturalists, etc.);
- informal (coteries, organizations and clubs of naturalists, etc.);
- non-formal (the media, etc.).

Lithuanian extracurricular activities of natural science education are mainly informal and very rarely – non-formal. The concept of Lithuanian education (1992) states that „a pupil or student can additionally develop his/her abilities, advance cognitive interests and the need of self-expression in the institutions of the coherent educational system“. However, the extracurricular activities of natural science education need certain conditions to be established. The assessment of the extracurricular activities of the foreign institutions (Zaleskienė, 1993) reveals two main tendencies of pupils’ activities:

- cognitive-technical;
- ecologic-exploratory.

The majority of the foreign countries have an explicated network of the institutions engaged in learners’ extracurricular activities. There are a number of different clubs, organizations, societies that offer different curricula of natural sciences. Lithuanian extracurricular activities of natural science education have deep-rooted traditions.

Lithuanian school ran various coteries, cells, etc. in 1918-1940. The extracurricular activities of natural science education of the Soviet period did not gain wider dimensions. Moreover, closer attention was devoted to teaching individual subjects at school. Lithuanian extracurricular activities of natural science education of the year 1990 – 2010 were developed pretty rapidly. In general, extracurricular activities are a wonderful means of meaningful occupation of children. For example, more than 100 thousand Lithuanian pupils participated in different programmes, sections, contests and other events of the national extracurricular activities institutions in 1995 (Makarskaitė, 1998). The present national centre of the young naturalists and 8 naturalists‘ sections count more than 3 thousand pupils.

We suppose that the main reasons encouraging to turn more careful attention to extracurricular activities of natural science education are as follows:

- the primary school curriculum is wide and includes different fields of science;
- according to teaching curriculum, natural science education is directly dedicated two classes per week while the native language has 7-8, mathematics – 4-5 hours;
- extracurricular activities compensate some drawbacks of the training process as well as supplement it directly: impart information, generate interests within the process of practical activities, broaden experience, improve knowledge;
- in a way the pupil is free from the teacher and obligatory learning.

Schoolchildren can immediately join the actions of nature protection, are attached to conditions to better acknowledge, enjoy and protect nature, they can apply the undertakings of the great respect for life in the process of the extracurricular activities of natural science education. Everything mentioned is the basis to foster moral values such as responsibility, sincerity, respect for environment and human being. The extracurricular activities of natural science education seem to be the medium for the child where s/he feels to be safe, protects others, transfers his/her abilities and attention to an environment that is the place to live and to act.

> „Club activities are just as an important structure that stays in the background of the changes of paradigms as well as a precondition to train individual value-based maturity. It is significant to the process of strengthening the interaction with nature and life as knowledge without this relation fades out or is rejected. However, the overloaded school curricula are still preventing from the interaction establishment. Moreover, crimes, narcotic addiction, alcoholism and other anti-social habits proliferate among the young people. Fight with the mentioned mischief most frequently is the battle with outcomes not with reasons. Try to involve pupils into the heightened activity and we will avoid numerous adversities“ (Šapokienė, 2001, p.12).

Some educators assert that the extracurricular activities of natural science education should combine broadening of knowledge and experience that cannot be obtained at school. In other words, the extracurricular activities of natural science education are treated bearing in mind the exact meaning of the word – "to plug" the gaps of formal natural science education.

Ability to feel inward relations with nature is extremely important to the pupils of primary school (this age range is auspicious to foster affective value-based relations with nature)

This is the basis of successful mastering natural science knowledge. It encourages to take interest in the environment as well as to communicate with nature and to perceive himself/herself as an inseparable part of it.

In our opinion, the extracurricular activities of natural science education should be directed towards:

- training positive personal qualities (individual training using extracurricular activities of natural science education) (for example, independence, responsibility, kindness, etc.).
- the development of the correlation between human being and nature (for example, a non-consumable humanistic approach towards nature, the sensation of the unity between nature and human being, respect for nature, etc.).

However, not the whole arranged pupils'extracurricular activities of natural science education are effective and produce desirable results. Hence, it is important to find out the structure and dynamics of pupils' activities in nature and to continually advance the EANSE patterns of organization.

The following effective the EANSE patterns could be distinguished.

- the coteries of natural science education (*ecology* / for example, "Lovers of Nature", "Ecology and Creativity", etc. /*based on single subjects* / "The Young Zoologists", "The Young Entomologists", etc./ and others);
- complex excursions of natural science character;
- children's creativity (affective children's experience in nature is expressed by the creative activities such as poems, essays, drama, games, art, etc.);
- learners' participation in projects (for example, projects on ecology – environment protection);
- actions (for example, „Planting a Tree", „Nesting Boxes – Birds' Home", „Birds and Animals' Protection", „Economy of Water and Electricity", „Making My School Green", „Planting Oaks", „Speak to Grass", etc. / responsibility is fostered, want is understood/);

- quizzes and get-together events (for example, „We and Nature“, „Blooming in Autumn“, „I Know Them“; etc.).
- contests (for example, painting, writing, contests of different character and at different level).
- clubs and camps (for example, „Little School of Nature“).

The implementation of the extracurricular activities of natural science education finds important the following points:

- the process of the extracurricular activities of natural science education has to involve the most important participants: pupils, teachers, parents;
- the extracurricular activities of natural science education are based on the common objectives of natural science education;
- the extracurricular activities of natural science education help to effectively integrate all knowledge of the subjects that pupils are taught at school;
- the extracurricular activities of natural science education are in opposition to the theoretic and classroom-based nature study.

The extracurricular activities of natural science education can be defined as a part of permanent education that should guarantee the complete development of pupils' physical, psychical and emotional power. It is an excellent opportunity for pupils to improve their natural science education with a help of different coteries, arranged camps, actions, projects, etc.

Thus, obviously, the extracurricular activities of natural science education in primary school are an influential field of pupils' training that is extremely useful to fostering affective value-based relations with nature, to cherishing love for nature and respect for life. In general, the majority of children of this age realize the importance and significance of activities related to nature and this is the main point of the extracurricular activities of natural science education training. Also, there are a variety of ways to create extracurricular activities in science education area at a primary school. In every moment teachers should be ready to implement extracurricular activities in real school life.

2010
Problems of Education in the 21st Century, 19, 5-8

INTEGRATED SCIENCE EDUCATION IN THE CONTEXT OF THE CONSTRUCTIVISM THEORY: SOME IMPORTANT ISSUES

IT is obvious that many scientists nowadays speak about constructivistic approach in education. This topic is becoming very trendy. Is it correct to focus our attention only to the study of this topic? This is a really complicated issue. There are quite a large variety of opinions, as well as controversial. First of all it is obligatory to perceive the idea of integrated science education in the context of constructivism as a theory of learning. Secondly, it is important to understand and name the specificities of integrated science education implemented following the principles of constructivistic teaching/learning. Thirdly, it is necessary to be able to predict the possibilities of integrating the content of different subjects of science related to the specificities of students at different age stage as well as to material and human resources (Lamanauskas, Vilkonienė, 2008). Generally speaking previous studies implied that the development of a constructivist-learning environment could contribute positively to changing student attitudes toward science learning (Oh, Yager, 2004). However, we can not make an one-sided evaluation. Who can deny that the traditional teaching and learning is wrong?

Constructivism may be considered an epistemology (a philosophical framework or theory of learning) (Jean Piaget, 1967, http://en.wikipedia.org/wiki/Constructivism_(learning_theory)#cite_ref-0), which argues humans construct meaning from current knowledge structures. Knowledge should not be divided into different subjects or compartments, but should be discovered as an integrated whole (McMahon 1997; Di Vesta, 1987).

The fact is that constructivism carries a major influence in contemporary science education, although it has been the subject of a heated debate. Remarkably, one of the most important implications of radical constructivism challenges the processes by which individual students actively construct their own knowledge.

Constructivism has always skirted round the actual learning of an established body of knowledge ... students will find that words are used in new and standardised ways: problems which were never even seen as being problems, are solved in a sense

which needs to be learned and rehearsed. For a time all pupils may feel that they are on foreign land and no amount of recollection of their own remembered territory with shut eyes will help them to acclimatise. (Solomon, 1994, p. 16). Learning science involves being initiated into the culture of science. If learners are to be given access to the knowledge systems of science, the process of knowledge construction must go beyond personal empirical enquiry. Learners need to be given access not only to physical experiences but also to the concepts and models of conventional science (Driver et al., 1994, p. 6). Most science teachers try their best to explain things clearly, to make use of metaphors, to use demonstrations and practical work to flesh out abstractions, to utilise projects and discussions for involving students in the subject matter, and so on. They realise that many, if not most, things in science are beyond the experience of students and the capabilities of school laboratories to demonstrate. The cellular, molecular and atomic realms are out of reach of school laboratories, as is most of the astronomical realm. Most of the time even things that are within reach do not work. It is a rare school experiment that is successful. For children, a great deal of science has to be taken on faith. Good teachers do their best in the situation, and try to point out why faith in science is warranted. In that case the approach of integrated teaching/learning is the best choice.

The processes of integration are visible in science, technologies and economy including education. The discussions about integrated education focused on the integration of teaching content are frequently held. The future will show whether it is fashion or necessity. One point is clear – the integration of teaching content is a burning issue of contemporary didactics. The following main objectives make the dignity of integrated teaching evident:

- to conclude and classify knowledge imparted by sciences;
- to reveal the affinity of the key (general science) concepts;
- to reduce the flow of secondary information, to concentrate on teaching how to use the sources of information (for example, encyclopaedia, reference books, dictionaries, audio-video material, etc.);
- to make teaching/learning interesting, attractive, true to life, etc.
- to train pupils to adopt various classified courses in higher forms, etc.

Thus, integration is the development of a new wholeness from the previous different units, components, for example, the content of teaching subjects, the kinds of activities, etc. The characteristic features of the child or teenager should not be forgotten along with the theoretic examination and practic solution of the questions of integrated natural sciences teaching. *First*, the processes of the child's memory in terms of quality and quantity change (for example, visual-sensorial, emotional memorable, etc.); *second*, the qualities of pupils' cognitive activities (thinking, observation) are remarkably diverse (a particular group of pupils should manage to perceive integrated material); *third*, a successful solution of the issues of psychologic adaptation is considered to be an important point (new textbooks, new curricula, requirements,

etc.); *fourth*, contemplation on the basis of concepts prevails at school age, i.e. the world is accepted as the generalization of the main features of objects and phenomena. Incidentally, such thinking form only in childhood (Vygotskij, 1934); *fifth*, the level of abstraction increases together with the degree of integration.

The younger the child the less s/he knows and manages, and therefore in terms of him/her, the degree of the integration of subjects has to be limited

---

Certainly, teachers themselves should know more about the styles of teaching/learning and different patterns of work organization (Eric W.K.Tsang, 1997). Pedagogues must communicate, argue and seek effective ways in order to hold teaching material in pupils' memory (Schlesinger, 1996). The author maintains that every integrated curriculum has to include two modules – thematic and functional. The teaching curricula that should reproduce the integration of content as well as of the process become notable. The integrated courses of natural sciences should be coordinated with the systemic ones. The integrated course of teaching has to be undertaken by the complex of training aids/resources for learning such as textbooks, workbooks, didactic material, teacher's book (teaching methodology), visuals, etc. They guarantee increased activities that are directly proportional to the efficiency of teaching/learning.

The constructivist theory of teaching must be based upon the constructivist theory of learning (Selley, 1999). The constructivist framework challenges teachers to create environments in which they and their students are encouraged to think and explore the scientific knowledge (Brooks & Brooks, 2001; Fosnot, 1996).

The elements of constructivist theory in the classroom may be summarized as follows (Richardson, 2003, Brooks& Brooks, 2001):

- attention to the individual and respect for students' background or prior knowledge)
- encouraging and facilitating group dialogue
- planned and often unplanned introduction of formal domain knowledge into the conversation
- provision of opportunities for students to determine, challenge, change or add to existing beliefs and understandings through engagement in tasks
- development of students' metaawareness of their own understandings and learning processes
- use of cognitive terminology such as "classify", "analyze", "predict", and "create"
- evaluating the students in process and give priority to their participation.

Constructivism has done a service to science and mathematics education: by alerting teachers to the function of prior learning and extant concepts in the process of learning new material, by stressing the importance of understanding as a goal of science instruction, by fostering pupil engagement in lessons, and other such progressive matters. Constructivism has also done a service by making educators aware of the human dimension of science: its fallibility, its connection to culture and interests, the place of convention in scientific theory, the historicity of concepts, the complex procedures of theory appraisal, and much else.

The integrated course of natural sciences should form the base amount of natural science knowledge (in a broad sense), i.e. "a formal component", as every teacher tries to identify the priorities of his/her teaching subject and the criteria of the efficiency of peculiar teaching methods and forms. The preparation of the integrated course of natural sciences is a concurrent part of teaching, optional, extracurricular, etc. courses. The educational curricula have to reflect the integration of the content of the teaching/learning process. The integrated and systemic courses of natural sciences should be combined. A real correlation and its reflection in the child's psycho physiologic abilities, skills, aptitudes and interests during the educational process at different age range is acclaimed to be a very important indicator of the content of natural sciences integration. The integration of the educational process has to be coordinated with didactic differentiation that is determined by unequal pupils' knowledge, different interests and teaching motivation, unlike intellectual motivation, self-control skills, etc. Self-sufficiency, the principles of freedom of choice and responsibility, psychologic learners' adaptation should be stressed when preparing the integrated courses of teaching/learning. More attention should be paid to schoolchildren's personal perfection, the development of differentiated teaching and evaluation, the accumulation, classification, assessment and usage of information and to the development of other skills, the alteration of group and individual work in the educational process. The integrated teaching course has to be guaranteed by the means of teaching/learning such as textbooks, workbooks, didactic material, visual aids, etc. as well as by the teacher's proficiency to work at qualitatively new level in a new century. A crucial point is a practic check of the set patterns of the content of integral natural science education that could be applied for a particular socio-cultural environment.

2010
Problems of Education in the 21st Century, 25, 5-9

ECOLOGIZATION OF THE WORLD OUTLOOK AS THE KEY PURPOSE OF EDUCATIONAL PRACTICE

IT is obvious that the educational model of the XXI century is oriented at the goals of Sustainable Development. This topic is becoming very trendy and urgent in and outside Lithuania**.** Recent correlation with nature carries a problematic character. D. Birnbacher proposes that "bearing in mind the increased people's possibilities to influence the future of humankind and other conscious beings, responsibility for the future generations… is an incontrovertible duty" (Birnbacher, 1980). None of the environmental protection laws could tackle problems of ecology as a huge part of a contemporary society produces a primitive ecologic culture and very often is completely illiterate. Therefore, the tasks of primary ecology education are to foster ecologic pupils' culture and raise their ecologic consciousness because the past and present life offers a great number of lessons in ecology including ecology catastrophes, anthropogenesis impact on nature (20th century), etc. Moral responsibility for natural (environment) preservation is relevant as never before today. Hence, the *ecologization of the world outlook* of society is also crucial. From this point of view, academic literature on methodology suggests different positions:

- The construction of the ecologization of the world outlook is a task of 21st century Mendelejeva, 2000; Lamanauskas, 2001, etc.);
- The development of positive children's thinking (Kulijev, 2000 etc.);
- The creation of pupils' mentality of ecology (Tokarskaja, 2000 etc.), ecologic culture (Akvileva, Klepinina, 2001 etc.) and cultural ecologization of the world outlook in general (Zacharova, 2000).

The ecologization of the world outlook is implemented mastering the ecologic culture of the epoch. The world outlook performs a crucial function as it puts together the control processes of perception and human activity, directly influences consciousness and sub-consciousness. The ecologization of the world outlook heightens the responsibility of ecology (Lamanauskas, 1996). On the other hand, the world outlook inwardly implements two basic components – *the world picture* and *sensual perception of the world*. The children's world picture is their cognitive-affective-value-based

comprehension of the world determined by individual cognitive- affective-value-based experience. Obvious expansion (in the context of natural science education in particular) of the childish world takes place in primary school. According to J. Vaitkevičius (1995), the world picture is the first stage of the world outlook. In other words, it is the extrinsic world observed with the five senses. Sensual perception of the world is the second "step" of the world outlook formation process. The pictures of the world are transferred into the intrinsic human world with the help of the senses and are based on the mind and ideas at this level. The shape of the concept is established.

The issue of the world outlook generates discussions in order to find proper definitions. However, in any case, the world outlook helps to explain the world, life and tries to describe why something has happened. Thus, the world outlook is the foundation of our life, and therefore it is an integral creation. Despite the diversity of evaluation *(different concepts of the world outlook vary)* the world outlook is a spiritual human phenomenon immediately concerned with a social activity of the subject. Recent perception of nature cannot be abstraction. Nature has to be grasped as the whole phenomenal system through the prism of social relations. The establishment of a harmonious correlation between nature and environment is a relevant task. The successful and effective implementation of the task needs strong, harmonious personalities that is, in turn, encourages to ecologize the world outlook. A contemporary situation of the educational system requires changes in the training process, pointing to the ecologization of the world outlook.

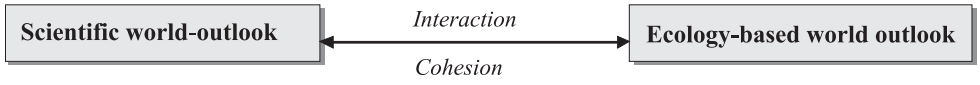

Figure 5: The interaction of the two components.

Dealing with the ecologization of the world outlook, attention should be turned to the following questions:

- Why is the ecological situation getting worse?
- Does an ecological crisis really mean a moral crisis?
- Why will not the ecological situation be able to be improved?
- Can we operate a real objective situation?
- Is the information describing the ecological situation available to everyone?
- Why is moral responsibility so important?
- Can the problem of "the ecology crisis" be tackled?, etc.

Therefore, the issue of the ecologization of the world outlook should be tackled in a complex way. A personal system of values – personal theoretic background (information) – practical individual abilities make a closely correlating system that

cohesively functions through a specific private activity. It is worth to refuse stereotypic, conservative attitudes towards the correlation between nature and environment. Only educational work cannot ecologize the world outlook, i.e. it is not enough to gain only theoretic knowledge about ecology as information has to be implemented in practise. Human being (a child or adult) must be able to continually evaluate predictable subsequences of any of the activities in nature. None of them can be based only on knowledge and mind (natural science positivism) as they are not absolute values. On the other hand, everyone should try to improve the ecological situation and feel a weighty responsibility as they are the vital factors of the contemporary human being. Hence, a society and nation should be interested to reach that yet primary school focused on the formation of the world outlook (ecologic aspect is extremely important) because at present technocratic, stereotyped and destructive thinking is alive and onward developed.

The process of the ecologization of the world outlook should follow as:

- The revelation of ecological problems.
- The required knowledge (information) to tackle the issues of ecology.
- Shaping the stereotypes and models of particular behaviour.
- Attaining an active personal position dealing with the questions of ecology.
- Continuous, systematic actualization of the principles of human morality.
- Ecology conscience and responsibility development.
- The correction of the ecologization of the world outlook.

The main possible expressions of the ecologization of the world outlook are as follows:

- The interpretation, comment, assessment and evaluation of the reasons and results of the ecological crisis (different kinds of literature, the press, role-play and imitation, eco-mysteries, etc.);
- Mastering the ecologic culture of the epoch through the educational process;
- Individual involvement in a specific, appropriate activity (for example, environmental protection, eco-actions, Greenpeace Movement, etc.);

The succeeding points should be highlighted in the discussion about the ecologization of the world outlook:

- The formation of the world outlook should not be versatile and effective without an ecologic aspect /component/;
- The ecologization of the world outlook means life in unison with nature;
- The crises of ecology and spirit are concurrently coherent;
- Ecology education is necessary for all types, stages and profiles of schools and *particularly in the rudimentary concentre*. Although only the elements of ecological field are apt in the primary school educational content, they are supposed to be necessary.

- Teachers should mainly deal with relevant issues of ecology, the evaluation of human behaviour in terms of ecology;
- The approaches to the world outlook are not the foremost points. Even more important factor is that every world outlook includes three essential components: cognitive, value-based and behaviour. Hence, the ecologization of the world outlook, in a broad sense, should follow all these directions that have to be coherently interrelated.

The achievements of natural sciences are striking today. The Universe, stars, planets, substances and their structure (mega and micro world) are the objects of research. On the one part, everything is brilliant but on the other part, the man and created technologies behave cruelly and remorsefully towards both nature and human being. The inward world is getting poor, the needs of consumerism have grown into compulsion of spoliation (a pragmatic correlation with nature). The youth's behaviour changes. They frequently kill and torture animals, act aggressively and sadistically. We simply cannot live and think that *apres moi le deluge***.** We must save the Earth, which is our unique shelter for the future generations. Thus, we have to foster respect for everything around us since early childhood. Generally speaking, the ecologization of the world outlook is the key purpose of educational practice today. And finally – the ecologization of all education demands more attention in the 21st century.

2010
Problems of Education in the 21st Century, 26, 5-8

TRADITIONAL AND CONSTRUCTIVE NATURAL SCIENCE EDUCATION PARALLELS

IN recent years attention to natural science education is not decreasing. In various information sources we can find a constantly expressed position that natural science – technological literacy of young generation is not only insufficient but also very often inadequate to the time requirements. We can claim with confidence, that the whole last decade (2000-2010) in one way or another was devoted to the discussion of the mentioned problem in various aspects. What is really important today and especially in perspective?

The answers to natural science technological education problem questions are not easy at all. The so-called public opinion of giving priority to social sciences has a particularly negative influence. The process when a great majority of youth choose social science field programmes for their studies and significantly smaller part chooses natural science – technological profile studies, has already been observed for the second decade. The motives are various here. First of all, it is groundlessly thought that social sciences are easier to study than natural science subjects. There is a part of truth in this. However, we feel the absence of government's clear strategic standpoint. Isn't it, that physicists, chemists, biologists, engineers and so on are not necessary in Lithuania any more? We can mention, that similar tendencies are observed in the other countries as well. Secondly, representatives of social sciences (these are also representatives of education, educologists) rather often groundlessly ignore natural science - technological education and its importance to a man. Even the official discourse analyzes children's rights, bullying, adaptation, motivation, social integration and other rather trendy questions more often than the second ones – guaranteeing natural science – technological education. There happen to be not rare cases when education communities do not acknowledge the researchers analysing natural science education problems, consider them to be "a substance", "polluting" pedagogics. In Western literature such a phenomenon is called "Science war" from social scientists. Basically, we can ask – whether this war is progressive or reactionary?!

We can say that a common European policy is opposite. In 2004 European Commission confirmed the declaration claiming that Europe needs more scientists (Europe Needs…, 2004). The same year a wide ranging international Rose research was started (Relevance of Science Education, 2004). The latter research basically revealed 15-year old population negative attitudes towards natural science education at school. Such negative tendencies were especially characteristic to so – called developed countries. Significant differences were established between developed and developing country students' attitudes. ROSE research was repeated in some countries in 2008. The same tendencies were noticed. Currently a new international research has been started to implement, which in a way prolongs ROSE research. This is a so-called IRIS research (Interests and Recruitment in Science: Factors influencing recruitment, retention and gender equity in science, technology and mathematics higher education, 2010). The main attention is drawn to how stimulate the youth choose natural science –technological profile studies, how to encourage them to choose the scientist's (researcher's) way. The situation is no better talking about adult society members either. The newest research (EUROBAROMETER, 2010) shows that European citizens are poorly interested in natural science – technological questions. It is paradoxical, that Europeans feel less informed than their needs and interests. Moreover, they feel less informed comparing with the situation in 2005. Also, people are prone not to believe in scientists, because the latter are more and more dependent on the business world. Various companies using finance flows manipulate the scientists. We can mention here a lot of urgent spheres such as GMO (genetically modified food), food additives, supplements and so on. This is a great challenge for the whole European community.

How is this connected with constructivist education approach? The answer to that question is not easy. The amount of introductory article is not sufficient to carry out exhaustive analysis, in other words, such analysis would require various wide range discussions. It is worth to mention some aspects. First of all, learners from different countries emphasize that natural science subjects at school are slightly interesting and of little importance to them. Such position has a rational explanation. On the other hand, natural science – technological information is more difficult to be mastered, it requires great efforts. Seeking to make natural science – technological education more attractive, constructivist - technological approach has become intensively spoken about. Very soon all this action is moved into educational practice. The learners are aimed to become constructivist learners. Traditional teaching is criticized constantly, trying to prove that such approach is absolutely not perspective. It is asserted, that traditional teaching separates completely teaching subjects, does not form conditions for their integration. However, the person knowing at least a little about integrated education problems could not claim like this because traditional teaching/learning doesn't contradict subject integration or integrated learning. On the other hand, constructivism is not a specific kind of pedagogics, is not

a panacea for overcoming education hardships or making teaching process more effective. This is first of all, psychological theory, postulating that people construct knowledge and senses referring to their own personal experience. This cannot be denied as well as cannot be denied the fact that knowledge or senses being constructed on personal experience are not necessarily right. After all, is the information that a concrete child possesses substantial for the true world cognition? After all, doesn't this require much more time for such "created" knowledge verification? Acting constructively, the acquired knowledge is considered your own, more important. One might understand that if the knowledge is acquired differently, it is already not important. It is absolutely not true. Who can deny that traditional teaching/learning is unsuitable? After all, what does traditional mean? Teaching/learning theories alter, are constantly supplemented, some of them are refused of at all. If we assert that constructivism theory is based on critical thinking educational methodology, in the same way we can claim that traditional teaching is based on realism philosophy ideas and this is not bad. What the child learns and what the teacher teaches him has to be true from the very beginning. This is a cornerstone idea. Any kind of later "re-teaching" when mistakes are being corrected, wrongly formed images and concepts are being destroyed is in principle, harmful and unwanted. Not in vain all of us know the classical axiom – repetition is the mother of science. The more we repeat (practice), the better we memorise. In this way our mind works. From this point of view we can express the main criticism on traditional teaching, when too little attention is devoted to practical aspects, teaching is theorised too much, then it becomes "lifeless", not urgent for the learner. However, this does not deny the essence of so – called traditional teaching. At last, as R. Mayer (2004) notices, constructivist approach being prevalent, the learner's active behaviour component is made a big thing, basically forgetting how it is important to be active in cognitive sense. We can give you such at first sight weightless argument. In Lithuanian schools constructive teaching approach has been applied in one way or another for more than a decade, however, natural science – technological literacy changes very little, in fact. Practically there are no essential changes. After all, we have to perceive that every theory, no matter how good it is, has its own limiting factors, is limited. There are no universal theories. Being in constructivist teaching environment, the learner gets minimalistic teaching recommendations and minimalistic support. The empiric researches, having been carried out for a rather long time, confirm that such an approach is not effective (Kirschner, Sweller, Clark, 2006). The statement that constructivist approach is identical to modern pedagogics is hardly true.

Thus, we can claim, that constructivist approach teaching natural science subjects is not the only one that is true. It is necessary to search for clear complex, mixed approaches based on systemic thinking and activity. From this point of view, applying of different strategies in teaching activity is an important and desirable thing. However, only good wishes aren't enough for this. Broadly speaking, a

suitable educational environment is necessary; secure working conditions have to be created for teachers and so on. After all, every educational situation is unique. Teacher's professional skills become a cornerstone and integrating element of the whole educational process.

2011
Problems of Education in the 21st Century, 28, 5-7

TEN THESES ON MODERN NATURAL SCIENCE EDUCATION

DESPITE of the fact that natural science education questions are constantly discussed, it is necessary to give much more real attention to this area. It is obvious that the spectrum of the topics of natural science education is too wide and one short article should not manage to cover all burning questions. The author has not raised a task to „exhaustively discuss“ the problems of natural science education. The author held the view that it is important to draw attention to some key moments. The most underlying ideas / theses of modern natural science education are as follows:

- It is necessary to form a system that would comprise the knowledge accumulated by all natural sciences, establishing the linkage between subjects, integrating the knowledge of natural sciences, creating a picture of the world and *turning back to the undivided individual world*. Thus, in order to clearly realize and understand our environment and nature, to perceive therein existing relations between phenomena and laws, to have an orientation in nature following the latest requirements for a scientific knowledge, it is equally important both, the differentiation and integration of natural sciences: the reconstruction of the “disjoined” nature as a unified system at a more advanced level of a theoretic cognition. The task to be resolved is in no manner easy; still the solution has to necessarily be found. The emphasis is put today on one of the reasons indicating why interest in natural sciences is decreasing. The point is that *natural science education (physics, chemistry, biology, etc.) stands behind the latest academic science achievements*. In order to know human being, one must to understand him without limitation to any solitary sciences or their groups. One has to combine a plenty of sciences, i.e. sociology, economics, history, philology, technology, etc. The look at reality (nature and human being) through the eyes and the mind of a philosopher is acclaimed to be a relevant point to wider realize nature and human being.

Philosophy that makes use of empirically generalized and collected data of natural and social sciences as well as the statements created by way of philosophers' *apriori* thinking, draws generalized conclusions about nature, human being and his/her place and role in nature and society. The necessity of *systemic thinking* (approach) unfolds and implements natural science education. Nature study (in a broad sense) is a complex, specific subject. Human being needs to be trained to feel nature and research it what makes him able to immediately communicate with it. Nature value awareness, experience and practice impersonation are the fundamental manifestations of the interaction between human beings and nature. This is one of the primary tasks of natural science education in the 21st century.

- Natural science education is a field of social sciences (primarily educology / educational sciences). *Public society approach to natural science education* (general needs, general level of culture, traditions in the light of interaction with nature, the need to have society and the young generation of a privileged natural science background, etc.), *its optimal conditions of implementation* (the standards of natural science education and material, human, etc. resources undertaking their success), *the development of the needs and motivation of nature study (in a broad sense)* (improving the need to perceive nature throughout all studies in comprehensive school, enhancing cognitive relation with nature, etc.), *natural science results: knowledge, abilities, relations* (studying natural sciences, etc.) are the crucial components of natural science education.
- The formation of *scientific research activity* (SRA) abilities acquired in comprehensive school is undoubtedly a very important field that has not received a proper attention yet. SRA should be highly stimulated and developed. Scientific research activity is responsible thorough work requiring great self-independence rather than entertainment. It makes student analytical thinking stronger and develops abilities to search for and use information, which helps them with learning how to analyze gathered material, prepare reports, make research presentations etc. Scant attention to scientific research activity is one of the reasons why science classes are not that liked by the learners. School must be the place where the learner could realize him/herself, consider and express his/her real wishes and discover how to choose important and complicated things. School has to create a cosy atmosphere for students with free and creative self-expression. Therefore, starting from school, conditions allowing the students to perceive their wishes, desires, feelings and abilities have to be formed taking into account an opportunity to apply them in practice. In this case, SRA is one of the above mentioned activities as it

creates possibilities of developing learner scientific and critical thinking, insights, creativity and personal features.

- A child faces nature very early, and therefore s/he needs to acknowledge it. We should help children to know it, to make them engaged in the environment they live, to approve their close interaction with natural phenomena and to explain the complexity of natural objects from earliest childhood. After all, it is not enough to say „I love nature". S/he has to admire, feel and confess it. The better a man perceives nature, the stronger becomes his/her correlation with the environment. The man turns into individuality. A human personality cannot progress if isolated from an animate environment. This cohesion should be fostered on the basis of peace from the early days. Analytic investigations in nature are highly important to all human stages of ontogenesis. The school forms the abilities of research work. The learned skills at nature acquisition will be helpful for daily life of the man. Teachers have to aware the role of research and analytic activities for patterning natural science world outlook of a young man. Reading books is not a key for nature perception. Even the latest computer technologies cannot suggest such information about nature that can be obtained through the observation and studies of natural phenomena. Children should be taught to feel nature rather than to be locked in the classroom. We are surprised that our learners' knowledge of natural science is dead. Schoolchildren's teaching through the observation of animate nature is one of the key ideas of the modern science education.
- The *respect for life* educational process is extremely important. The achievements of natural sciences are striking today. The Universe, stars, planets, substances and their structure (mega and micro world) are the objects of research. On the one part, everything is brilliant but on the other part, the man and created technologies behave cruelly and remorsefully towards both nature and human being. The inward world is getting poor, the needs of consumerism have grown into compulsion of spoliation (a pragmatic correlation with nature). The youth's behaviour changes. They frequently kill and torture animals, act aggressively and sadistically. We simply cannot live and think that *apres moi le deluge***.** We must save the Earth, which is our unique shelter for the future generations. Thus, we have to foster respect for everything around us since early childhood. The teachers should speak about respect for life in the classroom, about the integration of the educational content of universe science and other subjects more frequently as the level of pupils'concept of respect for life is insufficient. There is no doubt that contemporary school has to look after the moral structure of the young people's inner world, to develop

new relations with nature and form ecologic consciousness, duty and responsibility of a person.

- Natural science education is an integral phenomenon that can be grasped as a whole science. It is disintegrated in the substantial parts such as ecology, environmental education, etc. The parts of any of the units advance and finally settle in the complete wholeness. In order to understand the problems of natural science education, they have to be investigated complexly embracing different fields and levels.
- The content of natural science education gives a chance to the dynamics and structure of the educational process. However, the adaptation of natural science knowledge system depends on both the teacher (choosing and applying teaching methods and forms, etc.) and the learner (the methods of learning, motivation, general abilities). The diversity of teaching and learning content, forms and methods, activities are typical of natural science education. All that makes the educational process effective: develop intellectual knowledge and skills, set out conditions for intense pupils' activities, shape thinking, foster aesthetic feelings, etc. The importance of natural science education to the development of the child's personality is absolutely significant.
- Ecology education is a permanent process, thus it has to coherently take place in all forms of comprehensive school. Every age range is useful for ecology education. Therefore, we cannot think that if something has been lost in primary school, we will have a chance to improve. Full attention should be turned to primary school pupils as they receive propaedeutic, systemized and integral knowledge about nature which is the basis for the adaptation of information and attitudes (for example, environment protection) as well as for humanistic, aesthetic and cognitive motivation. Knowledge (information) about ecology could effectively be implemented only if suitable material facilities of training existed. Primary ecology education is a coexisting part of an immediate interest in nature, fauna and flora care, inhabited locality protection, responsibility for the results of human activity in nature. The sampling, adaptation and implementation of the content of ecology education using particular means (material facilities) are the foremost stages of integration. It could be justly maintained that *ecology is an integral component of primary natural science education*.
- *The extracurricular activities of natural science education* (EANSE) are one of the most significant fields of natural science education. The field hides inside numerous opportunities of choice. Whatever advanced natural science education is – it omits the functions and do not provide the opportunities that could be offered by the EANSE. Teaching is not and

cannot be limited only by classes at any stage of the educational system. Learners gain new experience in the extracurricular activities that is very important to broadening of creativity and other properties relevant to modern life. The usage of the latest information technologies, communication and cooperation, group work, the change of ideas and a critical approach towards social reality are the greatest abilities of human being in a new century.

- Nowadays ICT is rapidly developing. Different technologies are being created. The growth is characteristic not only at the university level, but also at other levels of the education system. It is accepted that ICT makes the process of teaching/learning more effective and beneficial whereas the education system starts functioning faster. The development of ICT and the process of globalization determine alteration in the education system as well as in the whole society. The implementation of new technologies in the educational process raises new possibilities for both teacher and learner, enhances education quality and makes the educational process more versatile. Therefore, technologies should not alienate from human being and reality. We should devote all our efforts to stimulating youth interest in science and technologies and to reinforcing scientific-technological education at all levels. Although hardly anyone suspects that technologies are having a growing impact on our daily life, however, they are still remaining alienated from the major part of society members and policy makers and what is more, frequently stand outside the door of the education system. Hence, opening the door is the obligation of all of us.

The mentioned ten theses correlate with natural science literacy in one way or another. It is clear that poor attention is paid to natural science education till now. Public natural science literacy is low. In the 21st century, every person encounters pressing problems of environment pollution, nature devastation, health, etc. New socio-ecological issues become pronounced (for example, air ionization in the room determined by computers). The 21st century is the one of technologies, genetics and information. We will be made to live a different life. The present situation is stressful, for example, overwork with computers, TV and other technologies determine a headache, sight problems, claustrophobia, etc. The man has a majestic and powerful mind, but often is full of evil spirits. He has a wish and possibility of making. However, he successfully destroys the creation. The scientists have expressed a serious concern over nature. Therefore, natural science education is not the only subject of discussions today. It is more frequently examined in a very broad context which is *natural science – technological – noosspheric* education. The professionals in natural science education accepts personal responsibility for the creation and extension of natural science educa-

tion which is supposed to be a primary duty and obligation. Consequently, training of the comprehensive school teachers of natural sciences and the permanent development of natural science competence are very important features from this point of view. School cannot effectively work without the teachers and education managers of suitable qualification. Generally speaking, natural science education is an integral part of general education and educatedness.

2011
Problems of Education in the 21st Century, 33, 5-8

HUMANISATION OF NATURAL SCIENCE EDUCATION AS A PROBLEM

THE present humankind has to solve a number of serious problems. Under the threat of the ecological catastrophe, concern for physical and spiritual health care is felt. All our relations with nature turn out to be problematic. *The establishment of a harmonious correlation between nature and society* becomes an important task. We cannot exclusively rely on knowledge and mind in any activity as these are not overall dimensions. Enforcement of humanism, democracy and being a good citizen - these are common everyday issues in our schools today. The goal of the education reform is to make a school the place for creating a personality and not only the place to pump with knowledge.

We also understand having no opportunities to become the lords of nature. According to Nazarenko, ecological problems can be solved taking advantages of science and technology achievements. However, the dynamics of the process should become individual and public, high virtuous and ecologic culture (Nazarenko, 1993). Therefore, the humanization and socialization of natural science education is a relevant pedagogic problem.

The author thinks that natural science education is notably supported by the heritage of an ethnic culture which can be applied:

- Trying to engage pupils in relating an expository subject to real life using different interpretations (customs, archaic village routine and works);
- Giving a sense to objects and phenomena of spiritual value-based level (mythology, Baltic religion, folklore);
- As a means to see phenomena and objects (birds call imitation, traditional medicine, ethno cosmology, weather forecast);
- For natural science education (annual holidays, songs, games, dances, roundelays).
- Humanization brings science closer to the humanistic criteria (Zakgeim, 1991). The author points out that the systems created by human being often backfire on themselves. Some authors (Rudenko, 1991, Kuznetsova, 1989, Zakgeim, 1991) perceive humanization as the “humanizing” of

training aids. The educologists of this trend mainly see two ways to solve the problem:

- "Humanizing" of training courses (chemistry, physics, biology), i.e. the popularization of scientific ideas and theories, highlighting of historic evolution, etc.
- Renovation of training aids (text books, supplementary didactic material, etc.)

Other authors (Uktveris, 1997, Vaitkevičius, 1998, Šapokienė, 1995) find humanization as the perception of a harmonious interaction between human beings and nature. According to Uktveris, "contemporary school is not ready to perceive and inspire the senselessness of consumerism, i.e. to lead a consumer way of life to the abyss that uncloses to humankind (Uktveris, 1997). Therefore, contemporary humanistic philosophy and other humanistic theories focus on the humankind difficulties highlighting the global crisis scale and format (Aramavičiūtė, 1996). Natural science education performs a leading role in the process of an individuality creation. Yet ancient thinkers called a man "zoopolitikon" (Aristotle). However, sciences including natural science education are specific. The essential thing is a question of what sort of philosophy will be the basis for natural science education (natural science education is a subject of social knowledge; thus it is a subject of social sciences /educology/). Yet human being set up "over nature" using *extrinsic* (sensual) and *intrinsic* (reflex) methods (20th century natural science positivism) and even has became the lord of it. Meeting his biological requirements human being started reformation of nature itself disregarding for possible consequences. Humankind has survived a negative influence of various theories (racism, Nazism, Marxism, social Darwinism, etc.). A well known Lithuanian thinker Paškus stated that "Marx paid attention to the lack of bread, Froid – to the lack of sex and Frankl – to the lack of sense. A westerner has already been full of bread and libido, but the questions of purport of life still worry. The signs of spiritual hunger seems to appear brighter and brighter (Paškus, 1992). The utopian ideas to create a "sterile" Gnostic instrument on the basis of natural science and biologic reductionism prevailed in the 20th century. G. Merkys maintains that an idea of constructive compatibility of various cognitive strategies is postulated in contemporary social research methodology (Merkys, 1997). Therefore, modern philosophical movements such as phenomelism, pantheism, etc. understand human being as a systemic unity of the body, psyche (*mind, emotions, volition*) and spirit (*trust, hope, love*). In this unity context is only possible natural science humanization.

Thus, considering the problems of phenomenological – hermeneutic natural science education *(the aspects of hypotheses generation, interpretation attempts, holistic approach towards an individual and society)* becomes righteous.

Pre-eminently the humanization of natural science education means the raise of values in the educational process

Yet human being perceives aesthetical, ethical or other values only when exceptionally subtly minded. The perception of nature as a value is primarily delimited the material interests. Aesthetical values are versatile and serve everyone. Perceiving and cherishing ethical values and moreover, following them is a more difficult task. A human educational process is a marvellous one as it is able to point out the subtle features of human mind and soul. From this standpoint, natural sciences teaching at school are very auspicious. In this case, the humanization of natural science education can be understood as an undivided action of the basic education principles in the training process. The humanization of natural science education (as indicated in the matrix) is only effective when implementing the systemic expression of these principles in the educational process.

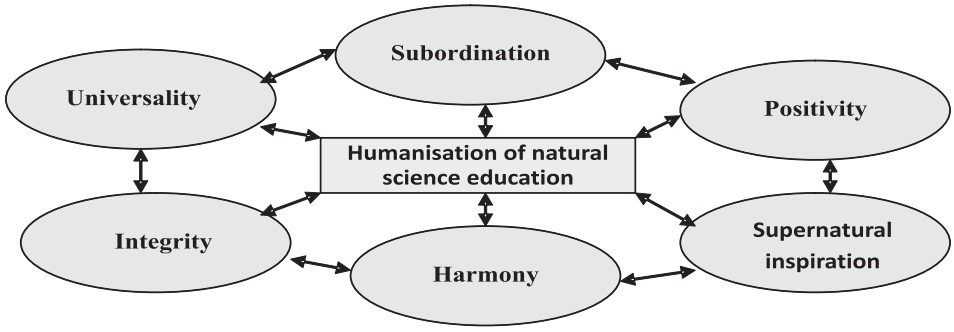

Figure 6: The matrix of the humanization of natural science education (Lamanauskas, 2003).

Hence, the major task of school to create respective conditions for every pupil to develop their intellectual spiritual world, to help and constantly promote mastery under the individual program giving more freedom to pupils to act and learn, not suppressing but encouraging their originality (Vaitkevičius, 1988). Another important aspect of the humanization of the educational process is that we need to pay close attention to responsibility sustaining and ability to predict possible negative outcomes (in nature and society).

Thus, contemporary school cannot be the only educational institution that trains the young generation for life – it has to be life itself. The child should not have felt being under an obligation and trying to escape from it.

DEVELOPMENT OF SCIENTIFIC RESEARCH ACTIVITY AS THE BASIC COMPONENT OF SCIENCE EDUCATION

SCIENTIFIC research activity (SRA) in comprehensive school is not a new phenomenon. Similar actions have been paid attention at various stages of education. Changes in the quality and quantity of the current stage of society development show a different situation: the pace of life increases, the "turbulence" of the surroundings is observed, globalization and social and economical changes in various segments of society gain more power. At the moment, the education system in Lithuania and other countries is facing different changes. As for the reorganization of Lithuanian education system within the period of the last two decades, it seems to be an intensive and ambiguous process. Lithuania had to pose two fundamental challenges: first, to proceed from the so called "soviet" system of education the one based on national identity and experience, and second, to adapt the new system to the needs for modern society fully integrating the experience of international education. The adjustment of national and international components has remained the major problem of Lithuanian education system up to now.

Without framing the concept itself, scientific research activity is the basic component of developing science education. Thus, the constant awareness of this topic is a definitely important issue. Our time requires human curiosity, continuous adaptation to the ever-changing life and active involvement in changes taking place in society. In this case, creativity, original thinking, self-sufficiency, etc. are necessary qualities.

SRA is obviously must be developed and reach an appropriate level in all comprehensive schools, including stages from the institution of pre-school education to upper-secondary school. Thus, three crucial moments must be considered:

- Finding / discovering / involving students as young researchers;
- Creating a system of educating students as young researchers;
- Training the staff undertaking SRA for students.

Leadership for young researchers and the arrangement of SRA are rather specific process, and therefore the staff must be offered appropriate conditions for working with young researchers and developing abilities of scientific research.

Progress in acquiring the abilities of scientific research activity closely correlates with the development of critical thinking, a choice in strategies for dealing with problems and applying them in practice, the effective use of different information sources, data processing, analysis, synthesis and interpretation and proposing hypotheses and alternatives. In terms of education, an important point is that students should not only better acknowledge natural phenomena, facts and laws, but also were able to align them with everyday experience and adapt to different situations. Scientific research activity creates the right conditions for a similar type of integration. Moreover, this is not only theoretical or practical knowledge, but also feelings and remarkable discoveries that, first of all, are very important to the child him/herself. In other words, such activity integrates and positively manifests an emotional component of a personality. It is worth mentioning that the process of scientific research activity fully discloses individual interests and abilities of students.

In one or another way, the abilities of scientific research activity obtained in comprehensive school are important to every student. However, it does not mean that the students will choose particularly this type of activity in the future. The developed students' need to independently research and discover, to be engaged and actively involved, to protect nature, natural resources and surroundings should be a considerable achievement. Another aspect is that such an environment is the place where bright students can usually realize their ideas. No less important is another aspect emphasized by different scientists. For instance, M. Hugerat, S. Zidani and N. Kurtam (2003) agree that there is a tremendous amount of information in variety of subjects that continues to accumulate. Thus, it must be achieved that individual scientific research activity should help students with acquiring as more knowledge and abilities as possible. It is obviously a wrong way to present information to the students as an „absolute fact" that must be memorized.

Researchers also notice (Tamir, 1991; Din-yan Yip, 2005; Reid, Serumola, 2006) that in the majority of cases, the school curriculum integrates scientific research activity. It seems to be a necessary and self-evident element. Nevertheless, the answers to the questions whether the activity is undertaken and effective and if the established goals are achieved are frequently missed. Can such goals be accepted as the underlying ones by teachers? Finally, working towards similar goals can be rarely defined as the focus of assessment, i.e. the aims of scientific research activity frequently carry a declarative character due to various reasons.

A crucial point is that the abilities to demonstrate scientific research activity must be consistent and uninterruptedly developed. Scrupulous attention should be paid, yet at primary school. The conducted research shows that this is the place where activity can be highly efficient (Lamanauskas, 2003; Coates, 2009).

Thus, the above expressed ideas allow making a conclusion that scientific research activity in comprehensive school is an integral part of the educational process. Such an action, didactically, is one of the most effective ways to increase students'

cognitive activity. Scientific research activity stimulates intellectual learner's potential and develops creative abilities. It is therefore important that much the same methods for promoting social and communication abilities and skills of students should be advanced. One of the most expected outcomes of this kind of activity is a formed positive attitude to further personal professional self-determination (Lamanauskas, Augienė, 2009). Thus, an obvious and valid point is that it is constantly necessary to bring together all students engaged in scientific research activity, deepen their knowledge and organize the activity bearing in mind opportunities, experience and interests with the major aim of developing abilities, skills, initiative and creativity regarding scientific research activity. On the other hand, this is promising and purposeful help to those preparing for studying natural science and technologies at university level. Such an outlook should be accepted by both teachers and students due to the fact that any kind of activity is related to expectations and a certain prospect for the future.

2012
Journal of Baltic Science Education, 11 (3), 200-202

A PROBLEM OF SCIENCE LITERACY ENCOUNTERED BY PRIMARY SCHOOL TEACHERS AND LEARNERS

SCIENCE education is one of the key areas of general education in comprehensive school (Lamanauskas, 2009). The major argument for defining the relevancy of the introduced subject is the universality and integrity of science education. For the last two decades, particularly this field of education has faced a number of different changes in the majority of countries: variations in the content of education, search for efficient forms and methods of teaching, innovative approaches, etc. are only a few questions that must be properly discussed. On the other hand, needs for the quality of provided services necessary for modern society are emphasized. The present community finds knowledge of science and ability to apply the acquired information in practice as the main priorities. The fields of exploitation of natural recourses and nature protection as well as the problems of ecology, biotechnology, genetically modified organisms, etc. have become everyday reality, i.e. the relationship between human and nature has grown into a complex and controversial process as never before, whereas human interests often oppose nature. The formation of responsibility for an impact on nature frequently accepts sciences as the core area of the educational process. However, this is totally impossible ignoring the nature and natural laws of evolution. Knowledge of nature is crucial, particularly at the young age. The main emphasis on education in primary school, in general, should be placed on assistance for schoolchildren to achieve a certain level of competencies such as moral values, knowledge, abilities. To acquire and develop skills, yet in primary school, the learners should observe, research and conduct experiments on both animate and inanimate nature. R. Makarskaitė makes a remark that 'research helps with acknowledging variety in animate nature and establishing relationships with inanimate nature as every component of the environment plays an important role. This is how an attitude towards nature protection and responsibility for the destiny of nature are formed' (Makarskaitė, 1996). Observations, experiments and research are efficient activities and help the children with a correct understanding of natural processes, human adaptation to the processes taking place in nature, perceiving troubled relationships between human and nature, etc. The informa-

tion obtained in primary school should assist the learners in applying the method of scientific research observing and analysing phenomena emerging in nature, developing the ability to collect and use data, knowing the ways to admit natural facts and phenomena, employ schemes, tables, diagrams, etc. and demonstrating skills at predicting the sequence of the actions taken, including the necessity for making corrections. To increase the level of science literacy, the students should know how to effectively combine methods and techniques for nature acquisition.

In this case, a more detailed discussion that science literacy achieved in primary school causes problems in the majority of countries is not required. For example, according to the results of the conducted international research PISA (*Programme for International Student Assessment*) focusing on the abilities of 15 year old students to deal with reading, math and science tasks, the results achieved by Lithuanian representatives are slightly lower than the international average (http://www.smm.lt/svietimo_bukle/docs/pr_analize/SPA(6)_Penkiolikmeciu_rastingumas.pdf). An idea that these results have been directly determined by the situation of science education in primary school cannot be accepted. On the other hand, we cannot completely agree that science education acquired in primary school will have no impact on the students' achievements at other stages of the educational process.

To achieve an adequate level of science literacy in primary school, the questions addressed to the education of science teachers must be seriously considered. If the main teacher's activity focused on gaining information about nature is based on interpretation and reading books, then, this activity will reflect a traditional educational methodology; in this case, the students will operate only theoretical knowledge and will frequently fail to understand the processes taking part in nature, i.e. in general, they will not be engaged in sciences at higher levels of comprehensive school. Optimal results can only be achieved it the teacher him/herself really likes his/her job, is constantly involved in research activities, encourages and helps children with a deeper understanding of nature and is particularly interested in the problems of sciences. An important point is that primary school builds foundations for science education the quality of which will have a powerful impact on further education of the young generation.

Thus, to meet the needs of all students and society, in terms of science education (competencies), the system of training/preparing science teachers, particularly that of primary school teachers (educational curricula, organization and content of pedagogical practice, etc.), must be upgraded. The evaluation of a number of parameters discloses that the science literacy of primary school teachers is not sufficient (for example, teachers frequently avoid trips to nature because have a poor knowledge of local natural area, have no skills at using special instruments, etc.). A primary school teacher must have enough knowledge and abilities of physics, chemistry, engineering and technology, ecology, etc. Systemic integral science preparation also plays a crucial role for primary school teachers. Nevertheless, obviously, only cosmetic changes in

training teachers will not be effective. Researchers representing several countries notice a lack of motivation in primary school and call this phenomenon "crisis" (Wang, 2004; Bennell, Mukyanuzi, 2005; Bhatti, Rawat, Hamid, 2012). This is common not only to developing but also to the developed and economically-strong countries. In this particular case, the motivation of primary school teachers for pedagogical activities is generally taken into account. Discussions on science education show this problem, particularly burning, because, traditionally, primary school teachers are not adequately prepared for teaching science and technology topics at an appropriate level. To deal with this question, withdrawal or avoidance are most frequently chosen. Attention is paid to social education. Some researchers accept (Goodwin, Orlik, 2012) it is vital that the teacher should be personally interested in the subject to be taught. Only the teacher able to develop students' ingenuity and creativity, encourage their curiosity and initiative and stimulate exploration, search and discovery can expect for good results of science education.

2012
Journal of Baltic Science Education, 11 (4), 300-301

NATURAL SCIENCE EDUCATION IMPORTANCE IN ADOLESCENCE

NATURAL science importance is indubitable. Research studies of the last few decades confirm such position. Science education has been frequently accepted as an inseparable and extremely important part of comprehensive schooling (Lamanauskas, 2008). By natural education we seek personality maturity in a wider sense. It would seem that everything is said concerning this question. However, it is not so. Rapid spread of scientific cognition inevitably raises new challenges for natural education, induces to re-evaluate generally used education strategies and methodologies. There is a rapid development of ICT; their penetration into educational environments is really intensive, though not always adequate to the raising educational goals. On the other hand, our understanding about human brain activity and possibilities is extending. Generally speaking, neuroscience opens new opportunities for people. Even though it is firstly connected with treatment, new treatment methods, on the other hand, the achievements in this field have a great influence on education. Scientists actively investigate changes taking place in human brain, for example, committing memorization process. In other words, while a person is learning, different physical, chemical, biological changes take place in his brain (Perkins, 2013). As researchers notice, each student brings a unique personal neural history to school every day, which gives teachers quite a challenge as they try to customize learning for each student (Trnikova, 2013). After all, neuro-linguistic programming can also considerably help to develop teaching/learning process. Quite often it happens that teachers apply such teaching ways and methods which most frequently correspond to their own teaching style. However, it does not mean, that such approach is compatible with the learners' learning needs, possibilities, style and so on. In this context, the moment of teacher's skillfulness is much more expressed, which is inseparable from educational effectiveness. And, what is more, XXI century requires different pedagogy, in this regard, natural science neuro pedagogy. Exhaustive scientific research studies are necessary in this direction.

Thus, a short glimpse of some natural science education moments makes us concentrate our attention to adolescence period in human's life. There is no aim here to exhaustively define adolescence age boundaries; however, according to practice existing in many countries, it comprises the pupils from grades 5 to9 (about 10/11- 15/16 years of age). It is understandable, that adolescence age boundaries are conditional. It is obvious, that teachers face a dilemma how to behave with a teenager – to treat him like an adult or like a child? Speaking about natural science education, it is understandable, that the pupils of this age already have a certain natural education, they have finished primary school. Giving general evaluation, one can claim, that their interest in natural sciences and motivation, mastering natural science knowledge and forming abilities at the period of primary school, do not raise any important problems. However, motivation changes later. It would be untrue to claim that motivation decreases. It just alters. Adolescence period is marked by acceleration, a certain adolescence crisis, the problems of the ability to think in an abstract way, increased emotionality, strengthening individualism and so on. In other words, the main question for the teenager becomes "What am I?" On the other hand, more active personality development is observed. Teenagers seek to be themselves, communicate with as many different people as possible, try themselves in different activities, to realize themselves and so on. However, the problem is not here. The problem is in the fact, that in many cases natural science education at that age period is realized between four class walls. Self-expression possibilities are rather limited. It is natural, that teenagers are looking for the other ways of self-expression, their motivational and value structure changes.

Natural surrounding is full of irritants, which directly determine teenagers' activity motivation. It should be sought, that their integral influence was used for the mature personality formation. Teenagers' insistence in respect of educators also immensely changes in this period of time. Thus, pedagogical competence is cornerstone. Nature subject teachers should be able to find the most optimal ways of natural science education process organization. This requires big efforts of educators and quite often nontraditional pedagogical decisions as well. In adolescence period, one of the most essential moments is to hold and further strengthen pupils' interest in natural sciences. Estimating various international research results, first of all, ROSE (The Relevance of Science Education, 2013), one can claim that this is, undoubtedly, primary educators' task. It means that it is important to teach perceive the acquired knowledge and be able to apply it in real life situations, create and model, independently carry out various practical tasks, search for information in various sources and be able to analyze, systemize and estimate it. Estimating adolescence context, it is necessary to make conditions for children to give themselves to natural, quite often spontaneous creation impulses. Natural science subjects should be given through the investigation process and not through factological approach, when the most important thing is to learn, that is, to master by memory. Discussions, stimulation of mental activity, reflections become of great importance. The compatibility of formal and informal educational sur-

roundings is a very significant moment in this period. It is obvious, that formal school is not capable of providing all possibilities because of various objectively restricting factor influences. However, it is necessary to search for optimal conformity of these mentioned surroundings. These can be various clubs, young naturalist summer camps, clubs, nature and technology museums' educational activity, expeditions and other. In adolescence stage, research, creative and project works become extremely important. Forming pupils' cognitive and practical abilities, such works should become the central part of natural science education. The format of their organization and carrying out can be various as well.

Modern and future ICT are inevitably opposition to natural surroundings. Their importance is not denied, however children (and especially teenagers) are intensively interested in these technologies, the latter occupy not a small part of their life. This is not necessarily directly related with learning at school. It is understandable, that school surrounding and teaching process itself are, as a matter of fact, saturated with different technologies. Today's physics, chemistry or biology lesson cannot be imagined without ICT (digital teaching/learning content, digital means, interactive and virtual demonstrative and experimental tests, various computer visualizations and other). In the same way, there is plenty of research, showing the effectiveness of ICT appliance, achievable better learning results. However, the question remains open – whether interactive and virtual natural science education can indeed change the classical one, when real tests, experiments, observations are performed. In other words, natural education takes place in natural surroundings maximally using current possibilities and searching for the new ones. It is paradoxical, natural science education ICT- zation increasing, very distinct natural science unpopularity is observed in the teenagers' population. It is claimed quite often, that ICT appliance in natural science lessons gives a chance to virtually carry out all experiments and tests when there are no proper conditions to carry out them realistically. This is a conditional thing. Very easy and fast ICT appliance does not encourage, in a way, to search for these proper conditions.

In any case, the teacher solves the whole lot of dilemmas and contradictions. Pupils are always different, individual. Teenagers' individualism is very much expressed. Some of them are getting interested and are interested in a concrete activity, while the others are waiting and can't wait for the end of the activity. It is obvious, that natural education in adolescence is, as a matter of fact, situational, integral and flexible. The main factors leading to teacher's success are creativity, skillfullness and erudition.

2013
Journal of Baltic Science Education, 12 (4), 396-398

SCIENCE AND MATH TEACHERS' COLLABORATION: HOW TO DEVELOP IT SEEKING PUPIL'S SUCCESS AT SCHOOL

THE importance of science and technology is obviously increasing. Such spheres as biotechnology, environmental security, biochemistry, synthetic biology, neurobiology and other have been strongly affected and even changed by science and technology progress. And that affect is growing. It is paradoxical, but over the last decade a decreased youth interest in science and technologies has been observed in many world countries. One of the first serious research studies on that question was initiated and carried out by IOSTE (International Organization for Science and Technology Education, http://ioste.nmmu.ac.za/). The research "The Relevance of Science Education", http://roseproject.no/) showed that there are essential differences among various countries. One of the most worrying problems is, that in so-called developed countries (e.g., Japan, Norway, Finland, Great Britain and other) the youth interest in science and technologies is poor, the biggest part of youth do not relate their career with science and technologies. Whilst, in so-called developing countries (e.g., Uganda, Philippines, Trinidad and Tobago, Botswana and other) the youth relate their future career with science and technology development and think that this is a guarantee for better life and success. The first international comparative research was carried out in 2004 and repeated in 2008. The results, basically, were similar. Later, the researchers carried out various comparative research studies applying additional variables, for example, (Human Development index, HDI). Again, the same tendency was confirmed, to be more precise, an inverse correlation relationship was obtained. The countries, whose HDI is high, the youth's interest in science and technologies is poor, and on the contrary, in the countries whose HDI is relatively low, the youth are interested in science and technology development. Though, these results are quite well known in academia, however, they are very important from the political and practical point of view (Lamanauskas, 2014). PISA and TIMMS research studies showed the same tendencies as well. Though the youth in developed countries understand the importance of science and technologies, however, this does not mean a lot to them. One of the most probable causes of such situation is, that at school it is not shown or (insufficiently shown) the importance of science and technologies for future

career possibilities. Why isn't this shown? Again, a lot of things determine such situation. First of all, science subjects and especially math are taught at school referring to formulas, theorems, blindly following the textbooks. Apparently, there is a lack of practical examples, real situations and problem solutions. It is understandable, that this requires much bigger resources – both material and intellectual. Thus, it is necessary to increase the possibilities for pupils to get acquainted with the practical appliance of sciences and math. This includes the attendance of university, plant laboratories, museums and other.

Over the latter several decades, in many European countries, it has been sought to improve science teaching both in comprehensive and higher schools. It is stated, that it is necessary to change traditional, didactic system to constructivist (Solomon, 1993; Zoller, Tsaparlis, 1997). It is grounded by various researches, that the mathematics concepts are critical for students' understanding of science (Schwols, Miller, 2012). Of course, it is a bilateral benefit. Both subjects are mastered better. Also, the other ways are sought to improve science and technological education of young generation. Recently, a lot of different level projects have been carried out, seeking to reveal the causes of such poor interest, on the other hand, it is sought to improve didactic instruments, used in comprehensive schools. Since 01-01-2013 a new European Union 7th Framework Programme (FP7/2013-2017) project "Mascil" has been started. The project unites 18 partners, science and mathematics teaching, common education, electronics learning and journalism experts from 13 countries participate in it (http://portalas.emokykla.lt/naujienos/Puslapiai/Naujiena11963.aspx). The main aim of the project is to develop inquiry-based science teaching. However, we think, it is not enough. Science education covers a wider content and context. It is necessary to develop scientific research activity. This is not only various research studies. Such activity includes project preparation and realisation, student involvement in a non formal science education structure activity, participation in various contests and Olympiads and other. In other words, attention is drawn not only to the pupils' demonstrating poor interest, but also to the gifted, talented pupils, interested in science and technologies.

Education practice shows, that despite certain science and math teachers' collaboration, it remains insufficient and very often inefficient in the meaning of pupils' achievements. It is obvious, that math teachers use scientific context doing math tasks. In their own way, science teachers use mathematics explaining chemistry, physics, biology laws and regularities or doing tasks. The problem is that teachers usually work individually; there is little of integrated activity. A wider and deeper collaboration is noticed in the science teachers' group. Math and science subject teachers collaborate much less (Lamanauskas, Šlekienė, Ragulienė, 2014).

Since 2013, an international project "Materials for Teaching Together: Science and Mathematics Teachers collaborating for better results" is being carried out. More about project and its realisation results one can find http://math.unipa.it/~grim/Prog_MaT2SMc_2014/Home_Prog_MaT2SMc.html. An international project MaT²SMc is one more tribute to science and math teachers'qualification improvement, science

education process quality strengthening. This project is carried out according to Lifelong programme, EU LLP Comenius project. It is sought to prepare concrete materials (scenarios of lessons and other educational activities), which could be used by teachers. It is oriented to science and math teachers' collaboration. Such material is supposed to be published and made freely available to all interested. Attention has to be paid, that such material is prepared by various country specialists; thus, concrete educational experience in one way or another will integrate in it.

Speaking about science and math teachers' collaboration, several important questions arise:

- How to develop teachers' collaboration seeking pupil's success at school?
- How to plan and project collaboration process?
- How to successfully collaborate seeking the pupils' progress?
- How to organise collaborative nets seeking teachers' work and pupils' educational success?
- How to rally collaborating teachers?

It wouldn't be easy to find the right and clear answers. However, it is obvious, that collaboration means a more qualitative final result. Collaboration, first of all, can be understood as a new space in which differences can be perceived and accepted as new possibilities. Traditionally, the teachers work individually; they mostly take care of their own subject. Collaborating, individual teacher's competencies are undoubtedly deepened and broadened; pupils' subject and inter-subject competence education is assured. It is hopeful that, being educational environment saturated with ICT in the latter years, new possibilities open for collaboration. Not only willingness of the teachers themselves, interest in collaboration, seeking education effectiveness in this way, is important. As B. Johnson claims (2014), "the school administrator is a critical factor in successful math and science teacher collaboration".

Teachers' collaboration is undoubtedly important. First of all, it is solving of various didactic problems performing together. Hereby, the abilities of this sphere are developed. Secondly, collaboration encourages the exchange of good educational experience, strengthens the trust among specialists of various spheres. Collaborating, the possibilities to organise common educational projects, to generate innovative educational ideas, to seek for closer integration of science and math, significantly arise. It is obvious, that mathematics is defined as a very important science and technology tool. Science and math teachers' collaboration in the educational process would strengthen not only professional teachers' competence, but would develop collaboration abilities, which are very important seeking much more qualitative pupils' science and technology education. It would be worth promoting more exhaustive educational research studies on this question and on the basis of them to prepare practical recommendations.

NATURAL SCIENCE AND TECHNOLOGY EDUCATION: "RESETTING" MEANING

NATURAL science and technology education is an inseparable part of general education. It is obvious, that this process embraces a rather wide group of people, according to the age – from the birth till the completion of general education. It is a very important period, during which a certain natural science and technology education is acquired. It might seem that rather many scientific, methodical, didactic and other articles, books have been written, analyzing NSTE problems. On the other hand, NSTE process continues, (has to be continued) further on. Of course, speaking about university and other level studies, a further education is different both according to the size and length and the other parameters.

One does not intend here to discuss exhaustively natural science and technology problems. The purpose is a little bit different. For the first time in Lithuania, 1st International Baltic Symposium on Science and Technology Education (BalticSTE2015) is being organised. After Lithuanian Independence re-establishment in 1990 – it seems to be the first such thematic international science event. To tell the truth, regional IOSTE symposiums took place twice in Lithuania. As it is known, IOSTE is an international organisation, unifying the most active world scientists in this field. In 2007, in Siauliai University, the 6th IOSTE Central and Eastern Europe country symposium, the theme of which was "Science and Technology Education in Central and Eastern Europe: Past, Present and Perspectives" took place. After two years, i.e. in 2009, the 7th IOSTE Central and Eastern Europe country symposium "Development of Science and Technology Education in Central and Eastern Europe" was organised. That was a serious change for the better not only developing natural science and technology education ideas, but also a good opportunity to share the experience with the other country scientists, to introduce the Lithuanian experience. However, Baltic countries haven't organised any bigger science event of such thematic up to now, which would expose and reveal the experience of this region. Over the latter decade, a tendency has been observed to organise regional science symposiums as a possibility to develop this field achievements. Similar

symposiums are organised in Africa, Asia, Latin America and so on. One has to believe, that this symposium will be meaningful not only to the Baltic but also to the other country scientists and all the other interested in this important sphere. One has to acknowledge, that there exists certain stagnation. There are relatively not many actively and productively working natural science and technology education specialists in Baltic countries. For various reasons it is rather difficult to integrate into international science space. On the other hand, it has to be emphasized, that Lithuania as well as Latvia and Estonia have a unique experience which could be interesting at an international level. Therefore, an exhaustive accumulated experience analysis is necessary. As an example, one can mention natural science education methodological history, published in Latvia from 1974 to 1940 (Vaivode, 2010). Such solid publication hasn't been prepared in Lithuania up to now. The other rather controversial period for all three Baltic countries is soviet occupation which lasted up to the very 1990. One can think that natural science and technology education was particularly unified in the whole empire of that time, however, this wouldn't be fair. It is obvious, that this period is poorly analyzed. It has been already written earlier about the urgency of natural science and technology education history (Lamanauskas, 2013).

However, I gave the name to the article "resetting meaning". Why? I want to emphasize some, in my opinion, important things. As I have mentioned already, the importance of early natural science and technology education is unquestionable. As J. Siraj-Blatchford (2001) notices, learning science is not simply knowing about 'natural phenomenon'. The educators' role is very important. This is not only natural phenomena explanation to this age children. This is an early natural science and technology literacy formation. It is important to involve children in common research activity, educate their abilities in making various things, it is important to find an adequate way to integrate ICT and so on. As it has been mentioned, historic NSTE aspect is very important. It is useful to include historical stories of scientific and technological discovery. In this way, nature understanding is encouraged, which will be very important for the children in the future, especially learning natural science subjects deeper. During this period, some problems arise. One of them is that very often educators are not properly ready for early natural science and technology education. A firm attitude remains that natural science and technology education will be realized in a general or secondary general education school. At least, Lithuanian educational experience allows asserting this. With an early NSTE is closely linked and related adult education. I dare to assert, that this is also a rather forgotten sphere, which is not paid proper attention to up to now. Natural science and technology youth and adult education isn't less important than early NSTE. Isn't it, that through this, first of all, is encouraged creative society and innovation development and so on. It is obvious, that not only in a pre-school institution or in the other formal educational institution it is being educated. With

the children associate their parents, grandparents and other adults. The researchers analyze this naming as "Intergenerational learning" (Jane, Robbins, 2007). This is also an educational environment. And here, adequate adults' natural science and technology literacy is very important as well. This can be understood as a kind of "bridge" between the early and late NSTE. Keeping an attitude that 21st century society is a lifelong learning society, this again becomes an unquestionable thing. And this in its own way requires "resetting": the attitudes, point of view, strategies and so on. Over the latter two-three decades, we have observed an obvious transition from ecological to environmental education and sustainable development education. This is a much wider understanding than just only ecological-environmental question raising or problem solving. Thus, it is important to strengthen the partnership of environmental specialists, pedagogues, parents and other adults, because joining their competencies, one can seek for society value attitude change, seeking respect for life, environment saving and environmental problem not only solving, but also prevention. Developing "bridge" concept, as joining children and adults, an important becomes family science and technology education. As the researchers accentuate, family science and technology education is defined as expanding science and technology knowledge and skills from the school to the home of students (Trna, Trnová, 2010). Also, one cannot forget that children and youth grow and develop in different environments. International scientific society much wider analyses so-called "street-science" (in order to teach simple things without complex materials).

And there is one more thing, which would be good at least in short to discuss, actualize. The "Resetting" meaning also lies in this, that we are "lost" in the labyrinths of various theories, approaches, positions, attitudes and so on. Looking systemically, it is obvious, that it possibly appears the other type of overcharging/resetting when a separate process does not function any more. Let's take an elementary natural science example. How does electrical overcharging appear? One of the cases is when a lot of devices through power distribution unit are connected into a socket. Such analogy can inevitably be applied to education sphere. Lately, natural science and technology education experiences the abundance of various theories, strategies, techniques and didactic approaches. One can dare to assert, that educational practice basically stays behind and most often does not take over the newest educational idea. Thus, periodical audit is necessary about what has been done, which strategies and educational approaches are most effective at a given time and in the near future. This is a very hard and complex task.

Though natural science and technology education is reformed in Lithuania, however, the results are not very pleasing. An urgent task remains for the whole educational community, how to achieve that natural science and technology subjects were attractive to the pupils that they tried to relate their future career with natural sciences and technology. It is understandable, that only school is not capable to solve that complex task. The situation is determined by the country's common

political-economic and, of course, social situation. However, properly organised natural science and technology education in comprehensive school can significantly change the situation. The responsibility of the school is to develop not a specialised teaching of natural science and technology subjects at school, but a general one, that every pupil acquired an adequate for that time natural science and technology education (Lamanauskas, 2008).

2015
Gamtamokslinis ugdymas / Natural Science Education, 12 (2), 60-64

NATURAL SCIENCE AND TECHNOLOGY EDUCATION: VALUES COMPONENT

ONE cannot doubt in the importance of Natural science and Technology education. Over the last two or three decades, attention to Natural science and Technology education has been significantly growing. On the one hand, science and technology development was encouraging this, on the other hand, one can observe a decreasing young generation interest in natural sciences and technologies. Paradoxical contrast – in technologically developed countries youth interest in natural sciences is significantly decreased. Completely different situation is in so-called developing countries. About such a situation a lot has been written, discussed, plenty of scientific research have been carried out and so on. It is obvious, that such a situation is determined by a great number of factors. However, in spite of this, education system has to change, to search for effective natural science and technology education forms and methods. The most important goal is suitable and adequate natural science and technology education of the young generation. However, what does suitable and adequate mean? What is suitability and adequacy content? Is it only quantitatively and qualitatively new knowledge and abilities? Conception, oriented only to pragmatics (only to knowledge, qualifications and/or competencies) in a certain sense is faulty. After all, some kind of competition goes, creating various education strategies and technologies. In other words, we are as if "lost" in the labyrinths of various theories, approaches, positions and attitudes and so on (Lamanauskas, 2015). A certain "resetting" is necessary, an audit of the current condition, an outline of perspective education development trends.

In recent years, both in Lithuania and in other countries, natural science and technology development is given emphasis to. Decreasing youth interest in natural sciences and/or technology has become a big concern. On the one hand, such concern is reasonable, because youth motivation choosing the studies at universities is usually directed to social and humanitarian sciences. E.g., in Lithuania, almost 50% of students choose the studies in social-humanitarian science field. Such a situation is determined by a number of reasons. To study natural sciences and technology is complicated enough, the studies are time consuming, require big efforts and so on. One can notice,

how in many world countries it is sought to popularise natural sciences in academic society, in schools and gymnasiums, to encourage pupils to choose natural science and technology studies. Western attitude is obviously practical. It is emphasised, that important are only technical sciences, such as physics, chemistry, cybernetics, biology, nanotechnologies and so on. Social-humanitarian sphere is quite often "pushed" aside. Earlier man used to feel inseparable from nature. Such dependency reflected through his way of life, customs, traditions, rituals, creation and so on. So-called present-day (civilised) man fell out of a habit to relate himself with everything what is alive, quite often the feeling of harmony, unity with nature and with the surrounding environment is alien for such a man. Constantly we hear information and/or read the news about endangered natural nature, devastated environment, global climate change and so on. Society more and more becomes pragmatic. Everything has to give benefit, profit and so on. What is more, according to prediction, after 2030–2040 we will enter the century of biotechnologies. Traditionally, science was characterised as value-free. However, as the researchers notice, the common characterization of science as value-free or value-neutral can be misleading, for example, scientists strongly disvalue fraud and error (Alchin, 1999). Besides, values directly condition and determine our behaviour. Earlier mentioned decreased youth interest in natural sciences and technologies is also related to values. According to A. Bishop (2008) in mathematics and science education values are crucial components of classrooms' affective environments, and thus have a crucial influence on the ways students choose to engage (or not engage) with mathematics and science.

Looking through various political documents, or following public discourse one can notice, that the necessity to educate not only pupils' but first of all teachers' initiative, enterprising and abilities to generate new ideas in the sphere of natural sciences, technologies, engineering and mathematics is constantly encouraged. I would like to draw attention to the fact, that it is not spoken or very little spoken about value component of natural science and technology education. Quite often education is directed towards the education of a typical consumer, a man who is not able to work well, is accustomed and is trained to get everything quickly, here and now, with minimal efforts, however taught to turn any truth (or axiom) or even world law into a simple personal opinion. As if everything depended only on man's attitude, opinion, position. One can say, that typical 20th century natural science positivism comes back, in the centre of which is an almighty man. However, what do we observe? We observe the planet Earth, more and more torn by nature elements and increasing pollution. So, value component of natural science and technology education should become a priority in all education system, at all its levels. Values should be systematically inoculated, directing young people to become mature personalities. This means the ability to apply the acquired knowledge and abilities practically, to solve everyday life problems, to educate self-confidence, feel responsibility and be able to adapt to the changing environment and seek to save the environment, suitable for the man's existence. Values are

formed not adapting to the situation “here and now”, but orienting to future perspective “there and then”. Value component of natural science and technology education should occupy a proper place in educational practice, and should be more exhaustively examined in a scientific sense. The most important value of such position is - a man is not and cannot be only nature consumer. He is responsible for the environment change and its conservation. It is understandable, that various value systems exist, which are based on various criteria. After all, values also constantly change. However, new values sometimes quite paradoxically entwine with the traditional ones, and in this ceaseless value change a certain their stability is also seen, a certain value “kernel”, which consolidates all the other values, gives essence to them (Kanišauskas, 2014). So, value component of natural science and technology education is and will remain one of the most important in an increasingly science and technology-based world.

2015
Journal of Baltic Science Education, 14 (6), 704-705

REFERENCES

Akvileva, G. N., Klepinina, Z. A. (2001). *Metodika prepodovanija estestvoznanija v nachal'noj shkole* [Technique of teaching natural sciences at primary school]. Moskva: Vlados.

Alchin, D. (1999). Values in science: An educational perspective. *Science & Education*, *8*, 1-12.

Anikudimova, E. A. (2004). *Pedagogicheskie uslovija preemstvennosti v estestvennonauchnom obrazovanii detej doshkol'nogo i mladshego shkol'nogo vozrasta*: Dis. ... kand. ped. nauk [Pedagogical conditions of continuity in natural science education of children of pre-school and younger school age]. Ul'janovsk, 269 c.

Anthony, G. (1996). Active learning in a constructivist framework. *Educational Studies in Mathematics*, *31*, 349-369.

Aramavičiūtė, V. (1996). Dvasingumas ir meilė [Spirituality and love]. *Acta Paedagogica Vilnensia*, *3*, 67-85.

Atutienė, B. (1999). Aplinkosauginiai klausimai pradinių klasių ekologinio ugdymo procese [Environmental issues in primary school ecological education process]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje (V respublikinės mokslinės praktinės konferencijos straipsnių rinkinys)* (p. 10). Vilnius.

Auškelis, R. (1999). Kaip stiprinti poreikį mokytis? [How to strengthen the demand for learning?] *Dialogas*, *40*.

Bajorienė V. (1976). Didaktinis studentų grupavimas [Didactical student grouping]. Kn.: *Aukštojo mokslo pedagogika*: Respublikinės konferencijos medžiaga (pp. 22-25). Kaunas.

Ball, D. L., Runquist, S. S. (1993). Collaboration as a context for joining teacher learning with learning about teaching. In. D. K. Cohen, M. W. McLaughlin, J. E. Talbert (Eds.), *Teaching for understanding: Challenges for policy and practice* (pp. 13-42). San Francisco.

Bennell, P., Mukyanuzi, F. (2005). *Is there a teacher motivation crisis in Tanzania?* Brighton: Knowledge and skills for development.

Bernotas, V. (1999). Ekologinės kultūros ugdymas [Formation of ecological culture]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje (V respublikinės mokslinės praktinės konferencijos straipsnių rinkinys)* (pp. 20-21). Vilnius.

Bhatti, T., Rawat, K. J., Hamid, S. (2012). Motivation crisis among primary school teachers: A descriptive study. *American Journal of Scientific Research*, *51*, 122-131.

Bigelienė, D., Uginčienė, E. (2008). *Nacionalinių mokinių pasiekimų tyrimų pristatymas švietimo konsultantams* [National student achievement research delivery to education consultants]. Vilnius: ŠPC. Retrieved from http://www.pedagogika.lt/index.php?1475461344 (30 August 2008).

Birnbacher, D. (Hrsg.)(1980). *Ökologie und Ethik* [Ecology and ethics]. Stuttgart.

Bishop, A. (2008). Values in mathematics and science education: Similarities and differences. *The Montana Mathematics Enthusiast*, *5* (1), 47-58.

Bitinas, B. (2006). Edukologinių tyrimų metodologiniai vingiai [Methodological turns of educational research]. *Pedagogika /Pedagogy Studies*, *83*, 9-15.

Blumenfeld, P. C., Krajcik, J. S., Marx, R., Soloway, E. (1994). Lessons learned: How collaboration helped middle grade science teachers learn project-based instruction. *The Elementary School Journal*, *94* (5), 539-551.

Bobrova, L. (2000). Projekto "Gyvasis pasaulis ir aš" pedagoginiai-psichologiniai aspektai [Pedagogical-psychological aspects of the project „Living World and Me"]. Kn.: *Ekologija: socialinis ir pedagoginis aspektas* (pp. 6-10). Šiauliai.

Broks, A. (2007). Science education as life experience for life. In.: V. Lamanauskas & G. Vaidogas (Eds.), *Science and technology education in Central and Eastern Europe: Past, present and perspectives* (The proceedings of 6th IOSTE Symposium for Central and Eastern Europe) (pp. 26-30). Siauliai: Siauliai University Press.

Brooks, J. G., & Brooks, M. G. (2001). *In search of understanding: The case for constructivist classrooms*. New Jersey: Prentice-Hall Inc.

Bruner, J. (1966). *The process of education*. Cambridge: Harvard University Press.

Bučiuvienė, S. (2007). Gamtamokslinių sąvokų formavimo pradinėje mokykloje ypatumai [Formation of natural science concepts in the third grade of primary school]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje – 2007* (XIII nacionalinės mokslinės praktinės konferencijos straipsnių rinkinys) (pp. 18-25). Šiauliai.

Budėnas, A. (1991). Diferencijuotas mokymas J. Laužiko požiūriu [Differentiated teaching by J. Laužikas point of view]. Kn.*: Jonas Laužikas: asmenybė ir darbai* (pp. 32-38). Kaunas: Šviesa.

Clement, P. (2008). Introduction to the special issue of SEI relating to critical analysis of school science textbooks. *Science Education International*, *19* (2), 93-96.

Coates, D. (2009). Developing challenging science activities for gifted pupils through action research. *Education 3-13*, *37* (3), 259-268.

Dawson C. (2000). Upper primary boys` and girls` interests in science: Have they changed since 1980? *International Journal of Science Education*, 22 (6), 557-570.

Deci, E. (1995). *Why we do what we do?* New York: A Grosset/Putnam Book.

Di Vesta, F. J. (1987). The cognitive movement and education. In: J. A. Glover, R. R. Ronning (Eds.), *Historical foundations of educational psychology* (pp. 203-233). New York: Plenum Press.

Din-yan, Yip (2005). Analysing laboratory manuals for an investigative approach. *Teaching Science: The Journal of the Australian Science Teachers*, *51* (3), 34.

Driver, R., Asoko, H., Leach, J., Mortimer, E., & Scott, P. (1994). Constructing scientific

knowledge in the classroom. *Educational Researcher*, *23* (7), 5-12.

Dupont J. (1993). Nepažangumas mokykloje [Poor progress at school]. *Švietimo naujovės*, 31.

Eisenhart, M., Finkel, E., & Marion, S. F. (1996). Creating the conditions for scientific literacy: A re-examination. *American Educational Research Journal, 33* (2), 261-295.

Etikos etiudai [The sketches of ethics] (1984). Vilnius, p.5.

Europe Needs More Scientists (2004). Report of the high level group on human resources for science and technology in Europe. Brussels. Available on the Internet: http://ec.europa.eu/research/conferences/2004/sciprof/pdf/final_en.pdf (Accessed 08/04/2011).

Fosnot, C. T. (1996). *Constructivism: Theory, perspectives and practice*. Teachers College Press, Columbia University.

Gable, R. A., Friend, M., Laycock, V. K., & Hendrickson, J. M. (1990). Interview skills for problem identification in school consultation. *Preventing School Failure*, *35* (1), 5- 10.

Gage, N. L., Berliner, D. C. (1994). *Pedagoginė psichologija* [Educational psychology]. Vilnius, p. 356-359.

Gajauskaitė, R. (1990). Ekologijos vieta pertvarkoje [Position of ecology during changes]. *Mokslas ir gyvenimas*, *2*, 3.

Gil'buh, I., Kondratenko, L., Korobko, S. (1991). Kak ne ubit' talant [How not to kill talent]. *Narodnoe obrazovanie*, *4*, 16-19.

Golubeva, A., Izjumova, S. A., i. dr. (1991). Opyt kompleksnogo issledovanija uchashhihsja v svjazi s nekotorymi problemami differenciacij obuchenija [Experience of a complex research of learners in connection with some problems of differentiation of teaching]. *Voprosy psihologii*, *2*, 132-140.

Goodwin, A. (2006). Constructing science education. *Journal of Science Education*, *7* (1), 4.

Goodwin, A., Orlik, Y. (2012). Communicating science: Between people, countries and cultures. *Journal of Science Education*, *13* (1), 3.

Gozer, G. (1991). Uchebnye programmy i social'nye problemy [Training programs and social problems]. *Perspektivy: Voprosy obrazovanija*, *1* (73), 7-19.

Gražys K. (1977). *Temos "Bendros žinios apie žiedinius augalus" diferencijuoto mokymo pamokos* [Differentiated teaching lessons on the topic "General knowledge of flowering plants"]. Vilnius: LTSR LŠM.

Grudenov, Ja. I. (1985). Psihologo - didakticheskie osnovy usvoenija uchebnogo materiala [The psychological didactical bases of assimilation of a teaching material]. *Himija v shkole*, *4*, 20-24.

Gurevičiūtė, G., Lekevičius E. ir kt. (1997). *Nojaus laivas. Ekologinis ugdymas mokykloje* [Noah's Ark. Ecological education in school]. Vilnius, p. 6-7, 11, 13-14.

Hugerat, M., Zidani, S., Kurtam, N. (2003). Teaching science through research. *Journal of Science Education*, *4* (1), 35-38.

Interests & Recruitment in Science: Factors influencing recruitment, retention and gender equity in science, technology and mathematics higher education (2011). Available on the Internet: http://iris.fp-7.org/partners/associated-partners/ (Accessed 08/04/2011).

Jakimanskaja, I., Abramova, S. i dr. (1991). Psihologo - pedagogicheskie problemy differencirovannogo obuchenija [The psychological pedagogical problems of the differentiated teaching]. *Sovetskaja pedagogika*, *4*, 44-52.

Jane, B., Robbins, J. (2007). Intergenerational learning: Grandparents teaching everyday concepts in science and technology. *Asia-Pacific Forum on Science Learning and Teaching*, *8* (1), Article 3. Retrieved from https://www.ied.edu.hk/apfslt/v8_issue1/jane/index.htm#con.

Jasvin, V. A. (2000). *Psihologija otnoshenija k prirode* [Psychology of the relation to the nature]. Moskva.

Johnson, B. (2014). Successful math and science teacher collaboration: The administrator's role. *Edutopia / What Works in Education*. Retrieved December 6, 2014, from http://www.edutopia.org/blog/successful-math-and-science-teacher-collaboration-administrators-role-ben-johnson.

Jovaiša, L., Vaitkevičius, J. (1989). *Pedagogikos pagrindai* [Pedagogy basics]. Kaunas: Šviesa, T.2, p. 222.

Kalmykov, A. A., Kalmykova, A. V. (2000). Tipologija otnoshenij cheloveka i prirody [Typology of the relations of the man and nature]. In: *II Rossijskaja konferencija po ekologicheskoj psihologii* (pp. 26-27). Moskva.

Kanišauskas, S. (2014). Vertybių erdvėlaikis: kaitos ir pastovumo problema [Values space-time: The problem of changing and stability]. *Filosofija. Sociologija / Philosophy. Sociology*, *25* (3), 164–173.

Kavtaradze, D. N. (1990). Priroda: ot ohrany – k zabote? [Nature: From protection – to care?]. *Znanie – sila*, 3.

Kirschner, P. A., Sweller, J., Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, *41* (2), 75-86.

Kisieliūtė E. (2002). Gamtotyros darbai pradinėje mokykloje [Nature observation activities at primary school]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje (VIII respublikinės mokslinės konferencijos straipsnių rinkinys*) (pp. 141-146). Šiauliai.

Kliminskienė, R. (1997). Ekologinis ugdymas: emocinis ir vertybinis santykis su gamta [Ecological education: Emotional and valuable relation with nature]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje (III respublikinės mokslinės praktinės konferencijos straipsnių rinkinys)* (pp. 26-29). Vilnius.

Kliminskienė, R. (1999). Ekologinis ugdymas ir nusikalstamumo prevencija [Environmental education and criminality prevention]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje (V respublikinės mokslinės konferencijos straipsnių rinkinys*) (pp. 37-42). Vilnius: Žaliasis pasaulis.

Kliminskienė, R., Kliminskas, R. (1998). Susitaikymas su gamta [Reconciliation with nature]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje (IV respublikinės mokslinės praktinės konferencijos straipsnių rinkinys)* (pp. 44-48). Vilnius.

Kuliev, R. D. (2000). Metody formirovanija pravil'nogo ekologicheskogo myshlenija u detej [Methods of formation of the correct ecological thinking of children]. In.: *Science and Education on the Threshold of the III-RD Millennium* (Vol. 2, p. 86). Minsk.

Kuznecova, L. V. (1989). Gumanizacija uchebno-vospitatel'nogo processa [Humanization of educational process]. *Biologija v shkole*, *6*, 27-30.

Lamanauskas, V. (2005). Komponent himii v soderzhanii obrazovanija nachal'noj shkoly [Chemistry component in the content of education of the primary school]. V kn.: M.

Bilek (Ed.), *Aktualni otazky vyuki chemie /Actual questions of chemistry education* (Proceedings of the 15th International Conference on Chemistry Education) (pp. 70-81). Hradec Kralove: Gaudeamus Publishing House.

Lamanauskas, V. (2003). Natural science education in Lithuanian secondary school: Some relevant issues. *Journal of Baltic Science Education*, *1*, 44-55.

Lamanauskas, V. (2005). Kai kurios metodologinės gamtamokslinio ugdymo tyrimų kryptys [Some methodological trends of scientific studies of the natural science education]. *Gamtamokslinis ugdymas / Natural Science Education*, *1* (12), 11-25.

Lamanauskas, V. (2008). Gamtamokslinis ugdymas mokykloje - neatsiejama bendrojo ugdymo dalis [Science education at school - an inseparable part of general education]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje - 2008* (XIV nacionalinės mokslinės-praktinės konferencijos straipsnių rinkinys, Utena, 2008m. balandžio mėn. 25-26 d.) (pp. 5-8). Šiauliai: Lucilijus.

Lamanauskas, V., Vilkonis R. (2006). *Internetas gamtamoksliniame ugdyme: situacijos analizė ir prognozės* [Internet in science education: Situation analysis and prognosis]. Šiauliai, p. 116.

Lamanauskas, V. (1996). Pasaulėžiūros ekologizavimas ugdymo procese [Ecologization of the world outlook in education process]. Kn: *Ekologija kaip socialinis procesas (tarptautinės konferencijos straipsnių rinkinys)* (pp. 44-47). Šiauliai.

Lamanauskas, V. (1998). *Integruotas gamtos mokslų dalykų mokymas taikant didaktinį diferencijavimą (daktaro disertacija)* [Integrated natural sciences teaching by applying didactic differentiation]. Vilnius: Vilniaus Pedagoginis Universitetas.

Lamanauskas, V. (1999). *Integruotas gamtamokslinis ugdymas: teoriniai ir praktiniai aspektai* [Integrated science education: theoretical and practical aspects]. Šiauliai.

Lamanauskas, V. (2001). *Gamtamokslinis ugdymas pradinėje mokykloje. Pasaulio pažinimo didaktikos pagrindai* [Science education in primary school]. Šiauliai.

Lamanauskas, V. (2001). Gamtamokslinis ugdymas pradinėje mokykloje ir universitete: studentų požiūris [Natural science education in primary school and university: students point of view]. *Pedagogika*, *52*, 163-173.

Lamanauskas, V. (2003). *Natural science education in contemporary school*. Siauliai: Siauliai University Press, 514 p.

Lamanauskas, V. (2008a). Ar tikrai grįšime į Jano Amoso Komenskio gadynę?! [Will we return to the epoch of John Amos Comenius] *Lietuvos Aidas*, *195*, 1, 3, 5.

Lamanauskas, V. (2008b). The augmented reality teaching / learning platform: Some implications for the present and future. In.: *Information and communication technology in natural science education – 2008* (Proceedings of international scientific conference) (pp. 5-7). Siauliai: Siauliai University Press.

Lamanauskas, V. (2009). Gamtamokslinio ugdymo stiprinimo svarba ir būtinumas pradinėje mokykloje [Importance and necessity of strengthening of natural science education in a primary school]. *Gamtamokslinis ugdymas / Natural Science Education*, *1* (24), 4-7.

Lamanauskas, V. (2009). The common goal of all educators: How to improve science and technology education. *Problems of Education in the 21st Century*, *16*, 5-7.

Lamanauskas, V. (2013). Gamtamokslinio ugdymo istorija: aktualumo aspektas [Natural science education history: Relevance aspect]. *Gamtamokslinis ugdymas / Natural Science Education*, *1* (36), 4-7.

Lamanauskas, V. (2014). Gamtos mokslų dalykų ir matematikos mokytojų bendradarbiavimas [The importance of natural science and mathematics teachers collaboration]. *Gamtamokslinis ugdymas / Natural Science Education*, *2* (40), 4-6.

Lamanauskas, V. (2015). Natural science and technology education: „Resetting" meaning. In.: Lamanauskas V., Šlekienė V., Ragulienė L. (Eds.), *State-of-the-art and future perspectives. Proceedings of the 1st International Baltic Symposium on Science and Technology Education (BalticSTE2015)* (pp. 7-10). Šiauliai: Scientia Socialis Press.

Lamanauskas, V., Augienė, D. (2008). Mokinių mokslinės tiriamosios veiklos gebėjimų ir susidomėjimo ugdymas bendrojo lavinimo mokykloje: situacijos analizė ir prognozės [Training of learners' scientific research activity abilities and interest in comprehensive school: The analysis and prognosis of the situation]. *Gamtamokslinis ugdymas / Natural Science Education*, *3* (23), 6-29.

Lamanauskas, V., Augienė, D. (2009). Moksleivių tiriamosios veiklos plėtojimas bendrojo lavinimo mokykloje: kai kurie teoriniai ir praktiniai aspektai [Development of scientific research activity in comprehensive school: Some theoretical and practical aspects]. *Gamtamokslinis ugdymas / Natural Science Education*, *1* (24), 19-27.

Lamanauskas, V., Šlekienė, V., Ragulienė, L. (2014). Gamtos mokslų ir matematikos mokytojų bendradarbiavimas: „MaT²SMc" projektas [Natural science and mathematics teachers collaboration: Project „MaT²SMc"]. *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje - 2014 / Natural Science Education in a Comprehensive School - 2014*, *XX*, 88-95.

Lamanauskas, V., Vilkonienė, M. (2008). *European dimension in integrated science education. Training material for students*. Olomouc: Palacky University Press.

Laurukėnaitė, V. (2002). Pradinių klasių moksleivių aktyviosios pažintinės veiklos įtaka žinioms apie negyvąją gamtą [The influence of practical cognitive activity of inanimate nature in primary school children`s knowledge]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje (VIII respublikinės mokslinės konferencijos straipsnių rinkinys*) (pp. 44-53). Šiauliai.

Laužikas, J. (1965). *Mokinių valios ugdymo bruožai* [The features of will education of students]. Vilnius.

Laužikas, J. (1974). *Mokinių pažinimas ir mokymo diferencijavimas* [Learner' cognition and teaching differentiation]. Kaunas: Šviesa.

Laužikas, J. (1982). Pradinių klasių mokinių mokymo ypatumai [Primary school learners teaching features]. Kn.: *Mokymo tobulinimas pradinėse klasėse* (pp. 6-18). Kaunas: Šviesa.

Lekevičius, E., Motiejūnienė, E., Kunskaitė, L. (1997). *Gamta ir žmogus. Mokytojo knyga 5 klasei* [Nature and man. Teacher`s book, 5 grade]. Vilnius, p. 15.

Leons, I. (1991). *Individualizacija obuchenija v processe reshenija fizicheskih zadach* (Avtor diss. kand. ped. Nauk) [Individualization of teaching in the process of the solution of physical tasks]. Moskva.

Levina, M. (1968). Differencirovannyj podhod k uchashhimsja v processe obuchenija [The differentiated approach to learners in the process of teaching]. *Biologija v shkole*, *3*, 30-33.

Lietuvos švietimo koncepcija [The concept of Lithuanian education] (1992). Vilnius.

Lukavičienė, V., Urbonavičienė, D. (1999). Mokinių ir gamtos sąveikos organizavimas

naudojant projektus [Organization of the interaction between students and nature using project work]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje: V respublikinė mokslinės konferencijos straipsnių rinkinys* (pp. 68-70). Vilnius.

Lukšienė, M. (1994). Prometėjiško žmogaus ugdymas. *Mokykla*, Nr.8, p. 3-5.

Mayer, R. (2004). Should there be a three-strikes rule against pure discovery learning? The case for guided methods of instruction. *American Psychologist*, *59* (1), 14-19.

Makarskaitė, R. (1995). Ekologinis ir aplinkosauginis ugdymas papildomojo ugdymo sistemoje [Ecological and environmental education in a supplementary education system]. Kn.: *Gamtamokslinis ugdymas vidurinėje bendrojo lavinimo mokykloje: problemos ir perspektyvos* (pp. 32-33). Vilnius: Žaliasis pasaulis.

Makarskaitė, R. (1996). Aplinkotyrinės Vinco Ruzgo idėjos ir šiuolaikinė mokykla [V. Ruzgas`s environmental study ideas and modern school]. Kn. *Gamtamokslinis ugdymas pagrindinėje bendrojo lavinimo mokykloje* (pp. 16-22). Vilnius.

Makarskaitė, R. (1998). *Gamtotyrinės veiklos ypatumai papildomojo ugdymo sistemoje* (Daktaro disertacija) [Peculiarities of environmental activity in supplementary education system]. Vilnius: VPU.

Makarskaitė, R. (2001). *Ekologinis ugdymas. Mokymo priemonė studentams* [Ecological education. Students workbook]. Vilnius.

Malinovskaja, Ju. V. (2002). *Principy postroenija i metodika realizacii propedevticheskogo kursa himii dlja 6,7 klassov*: Dis. ... kand. ped. nauk [The principles of construction and technique of realization of a propaedeutic course of chemistry for 6, 7 grades]. Sankt-Peterburg, 189 c.

Masaitis, M. (2009). IT situacija mokyklose [IT situation at school]. *IT ŽINIOS.LT.* Retrieved from http://www.itzinios.lt/straipsnis-301.html (Accessed 11 November 2009).

Matthews, M. R. (2000). Constructivism in science and mathematics education. In.: D. C. Phillips (Ed.), *National society for the study of education, 99th Yearbook* (pp. 161-192). Chicago, University of Chicago Press.

McMahon, M. (1997). *Social constructivism and the World Wide Web – A paradigm for learning* (Paper presented at the ASCILITE conference). Perth, Australia.

Mendeleeva, E. A. (2000). Zadacha obrazovanija XXI veka – formirovanie jekologicheskogo mirovozzrenija [The goal of education in the XXI century – formation of ecological world outlook]. In.: *Science and education on the threshold of the III-rd millennium* (Vol. 2, p. 91-92). Minsk.

Merkys, G. (1997). Socialiniai mokslai: reanimacija ar renesansas [Social sciences: Renaissance or resuscitation]. *Socialiniai tyrimai*, *1* (1), 4-8.

Meškauskaitė, D. (1977). Kurios - ne - kurios matematikos mokymo individualizavimo problemos [Some problems in individualization mathematics teaching]. Kn.: *Mokymo ir auklėjimo klausimai* (pp. 27-29). Vilnius: PMTI.

Mikalajūnas, D. (1993). Mokymo formų kaita pamokoje: teorija ir praktika [The change of teaching forms during lesson: Theory and practice]. *Pedagogika / Pedagogy*, *29*, 97.

Miltenienė, J., Mockevičienė, S. (1998). Ekologinio moksleivių ugdymo mokykloje sistema [System of ecological education at school]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje* (IV respublikinės mokslinės praktinės konferencijos straipsnių rinkinys) (pp. 84-90). Vilnius.

Mironov, A. V. (2001). Kurs jekologii dlja studentov pedagogicheskih institutov [Ecology course for students of teacher training colleges]. *Nachal'naja shkola*, *6*, 80-84.

Monahov, V., Orlov, V., Firsov, V. (1990). Differenciacija obuchenija v srednej shkole [Teaching differentiation in comprehensive school]. *Sovetskaja pedagogika*, *8*, 42-47.

Nazarenko, V. M. (1993). Rol' social'nyh, estestvennonauchnyh i tehnicheskih ponjatij v formirovanii jekologicheskih znanij [Role of social, natural science and technical concepts of formation of ecological knowledge]. *Himija v shkole*, *2*, 37-41.

Nezvalova, D. (2007). Initial science teacher training. In.: *Improving quality of science teacher training in European cooperation – constructivist approach* (pp. 7-14). Olomouc.

Nilsson, P. (2008). Recognizing the neeis – Student teachers` learning to trach from teaching. *Nordina: Nordic Studies in Science Education*, *4* (1/08), 92-107.

Obelevičius, S. (1995). Aplinkosaugos žinių sistema mokykloje [Environmental knowledge system in the comprehensive school]. Kn.: *Gamtamokslinis ugdymas vidurinėje bendrojo lavinimo mokykloje: problemos ir perspektyvos* (pp. 23-29). Vilnius: Žaliasis pasaulis.

Oh, P. S., Yager, R. E. (2004). Development of constructivist science classrooms and changes in student attitudes toward science learning. *Science Education International*, *15* (2), 105-113.

Osler, A. (1994). Development education in a developing country: A study of curriculum innovation in primary schools. *Compare: A Journal of Comparative Education*, *24* (1), 78.

Ots, Ja. J. (1975). *Effektivnost' individualizacij uchebnyh zadanij v V-VII klassah* (Avtor. diss. kand. ped. Nauk) [Efficiency of individualization of educational tasks in the V-VII grades]. Tartu.

Ovens, P. (2000). *Reflective teacher development in primary science*. London.

Paškus, A. (1992). *Idėjų sankryžoje* [The intersection of ideas]. Kaunas, p.56.

Perkins, R. (2013). What do memories look like? *USC News*. Retrieved 05 August 2013, from http://news.usc.edu/#!/article/52496/what-do-memories-look-like.

Plytnykienė, D. (2002). Gamtos pažinimo įtaka vyresniojo ikimokyklinio amžiaus vaikų protinei raidai [The influence of the knowledge about nature on the mental maturity of the elder pre-school age children]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje* (VIII respublikinės mokslinės konferencijos straipsnių rinkinys) (pp. 63-68). Šiauliai.

Plytnykienė, D., Rimkevičienė, B. (2001). Ikimokyklinio amžiaus vaikų tiriamoji veikla pažįstant gamtą [Research activities in environment cognition in pre-school education]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje* (VII respublikinės mokslinės konferencijos straipsnių rinkinys) (pp. 185-190). Šiauliai.

Powell, J. C., Anderson, R. D. (2002). Changing teachers` practice: Curriculum materials and science education reform in the USA. *Studies in Science Education*, *37*, 107.

Proskurina, N. A. (1986). *Celepologanie kak metod nravstvennogo vospitanija v uchebnoj dejatel'nosti* (Avtor. diss. kand. ped. Nauk) [Goal-setting as a method of moral education in educational activity]. Leningrad, s. 12-13.

Psichologijos žodynas [The dictionary of psychology]. (1993). Vilnius, p. 324-325.

Pukelis, K. (1989). Kai kurie bendrojo lavinimo vidurinių ir vidurinių profesinių technikos mokyklų pedagogų profesinės kvalifikacijos kėlimo bruožai [Some professional train-

ing features of secondary and vocational technical school teachers]. *Pedagogika / Pedagogy*, 160-161.

Qualter, A. (1999). How did you get to be a good primary science teacher? *Westminster Studies in Education*, *22*, 75-86.

Ragaliauskienė, R. (2004). *Darnaus vystymosi idėjos pradinėje mokykloje. Metodiniai patarimai, nurodymai, planai* [Sustainable development ideas in primary school. Methodical recommendations, guidelines, and plans]. Kaunas: Šviesa.

Rajeckas, V. (1994). Aukštųjų mokyklų, rengiančių mokytojus, pedagogizavimo kryptys. Kn.: *Švietimo reforma ir mokytojų rengimas: konferencijos tezės* (pp. 25-26). Vilnius.

Rauckienė, A. (1994). Ikimokyklnio amžiaus vaiko gamtinė aplinka ir jo sampratos apie gyvąją gamtą [The natural environment in pre-school age, the child and his understanding of it]. *Pedagogika / Pedagogy*, *30*, 138-142.

Raven, J. (1999). *The tragic illusion: Educational testing*. England, Oxford.

Reid, N., Serumola, L. (2006). Scientific enquiry. The nature and plane of experimentation: A review. *Journal of Science Education*, *7* (1), 5-9.

Relevance of Science Education, ROSE (2004). Available on the Internet: http://www.roseproject.no/ (Accessed 08/04/2011).

Richardson, V. (2003) Constructivist pedagogy. *Teachers College Record*, *105* (9), 1623-1640.

Riquarts, K., Henning Hansen, K. (1998). Collaboration among teachers, researchers and in-service trainers to develop an integrated science curriculum. *Journal of Curriculum Studies*, *30* (6), 661-676.

Roganovskij, N. (1991). Differencirovannoe obuchenie - kak ego osushhestvit'? [The differentiated training – how to implement it?]. *Narodnoe obrazovanie*, *3*, 41-43.

Rudenko, A. P. (1991). Posobie dlja realizacii idei gumanizacii himicheskogo obrazovanija [Materials for realization of the idea of the humanization of chemistry education]. *Himija v shkole*, *5*, 21-22.

S&T report, EUROBAROMETER (2010). Available on the Internet: http://ec.europa.eu/public_opinion/archives/ebs/ebs_340_en.pdf (Accessed 08/04/2011).

Sankar, Y. (2004). Education in crisis: A value-based model of education provides some guidance. *Interchange*, *35* (1), 127-151.

Schlesinger Phyllis, F. (1996). Teaching and evaluation in an integrated curriculum. *Journal of Management Education*, *20* (4), 479-486.

Schwols, A., Miller, K. B. (2012). Identifying mathematics content and integrating it into science instruction. *Science Scope*, *36* (1), 48-52.

Selley, N. (1999). *The art of constructivist teaching in the primary school*. London. David Fulton Publishers Ltd.

Shevchuk, T. A. (2005). Fakul'tativnyj kurs po himii dlja uchashhihsja nachal'nyh klassov [Facultative course in chemistry for learners of primary school]. Dostupen v Internete: http://www.germes.zp.ua/news.htm (prosmotr: 2009.03.08).

Shulman, L. (1987). Knowledge and teaching: Foundation of the new reform. *Harvard Educational Review*, 57, 1-22.

Simanonis, K. (1969). Diferencijuoto mokymo pamokos [Differentiated teaching lessons]. *Tarybinė mokykla*, *6*.

Simonova, A. (1974). Differencirovannyj podhod k uchashhimsja v uchebnom processe [The differentiated approach to learners in educational process]. *Biologija v shkole*, *2*.

Siraj-Blatchford, J. (2001). Emergent science and technology in the early years. Paper to be presented at the: *XXIII World Congress of OMEP***,** Santiago Chile July 31st to 4th August 2001. Retrieved from http://www.327matters.org/Docs/omepabs.pdf.

Smirnov, A. A. (1966). *Problemy psihologii pamjati* [Memory psychology problems]. Moskva: Prosveshchenie.

Solomon, J. (1993). The social construction of children`s scientific knowledge. In.: P. J. Black, A. M. Lucas (Eds.), *Children`s informal ideas in science* (pp. 85-101). London: Routledge.

Solomon, J. (1994). The rise and fall of constructivism. *Studies in Science Education, 23*, 1-19.

Sullivan, R. J. (1979). Students` interests in specific science topics. *Science Education*, *63*, 591-598.

Summers, M., Kruger, C., Childs, A. (2000). Primary school teachers` understanding of environmental issues: An interview study. *Environmental Education Research*, *6* (4).

Šapokienė, E. (1994) (sudaryt.). *Aplinkotyra* [Environmental studies]. *Mokomoji knyga jaunimui*. Vilnius: Leidybos centras, p. 9.

Šapokienė, E. (1995). Ekologinio ugdymo sistema mokykloje [The system of ecological education at school]. Kn.: *Gamtamokslinis ugdymas vidurinėje bendrojo lavinimo mokykloje: problemos ir perspektyvos* (pp. 3-8). Vilnius: Žaliasis pasaulis.

Šapokienė, E. (2001). *Mokykla+aplinkotyra=VIOLA* [School+Environmental studies=VIOLA]. Utena: "Utenos Indra".

Šapokienė, E. (1998). Miškas jaunojo gamtotyrininko akimis [Forest in the view of young nature researcher]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje* (IV respublikinės mokslinės konferencijos straipsnių rinkinys) (pp. 137-141). Vilnius: Žaliasis pasaulis.

Šiaučiukėnienė, L., Kaminskienė, G. (2001). Diferencijuoto mokymosi aplinka profiliniame mokyme [Differentiated learning environment in profiled training]. Kn.: *Profilinis mokymas* (pp. 6). Vilnius: LR Švietimo ir mokslo ministerija.

Šiaučiukėnienė, L. (1994). Mokymo diferencijavimo principai [The principles of teaching differentiation]. *Socialiniai mokslai. Edukologija*, *1*, 66-77.

Šiaučiukėnienė, L. (1996). Išorinis ir vidinis diferencijavimas [External and internal differentiation]. *Socialiniai mokslai. Edukologija*, *1* (5), 32-38.

Šlekienė, V. (1999). Praktinių užduočių funkcijos gamtamokslinių sąvokų formavime [The functions of practical tasks in the formation of science concepts]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje* (V respublikinės mokslinės konferencijos straipsnių rinkinys) (pp. 102-107). Vilnius: Žaliasis pasaulis.

Tamir, P. (1991). Practical work in school science: An anglysis of current practice. In. B. E. Woolnough (Ed.), *Practical science: The role and reality of practical work in school science* (pp. 13-20). Milton Keynes: Open University Press.

Tokarskaja, V. V. (2000). Formirovanie ekologicheskogo mentaliteta shkol'nikov kak social'no-pedagogicheskaja problema [Formation of ecological mentality of students as social and pedagogical problem]. In.: *Science and education on the threshold of the III-rd millennium* (Vol. 2, p. 105-107). Minsk.

Tomlinson, C. A. (1999). Mapping a route toward differentiated instruction. *Educational Leadership*, *57* (1), 12-16.

Toshev, B. V. (2008). Modern trends in the science of education. *Chemistry. Bulgarian Journal of Chemical Education*, *17* (3), 171-180.

Trna, J., Trnová, E. (2010). Family science and technology education as a new teaching and learning strategy for all including gifted students. In *XIV. IOSTE Symposium. Socio. -cultural and human values in science and technology education* (pp. 1143-1149). Ljubljana, Slovinsko: Institute for innovation and development of University of Ljubljana.

Trnikova, J. (2013). Brain-based learning strategies and inclusive education. *Technologia Vzdelavania / Technology of Education*, *3*, 7-9.

Tsang Eric, W. K. (1997). Organizational learning and the learning organization: A dichotomy between descriptive research. *Human Relations*, *50* (1), 84-85.

Tsavkova, M. (2009). Differentiating instruction. *Chemistry: Bulgarian Journal of Chemical Education*, *18* (2), 83-85.

Uktveris, A. (1997). Ekošvietėjiško laikraščio "Žaliasis pasaulis" galimybės: tausojančiojo vartotojo ugdymas [The possibilities of the ecological newspaper „Green World"]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje* (III respublikinės mokslinės praktinės konferencijos straipsnių rinkinys) (pp. 84-88). Vilnius.

UNESCO, EFA Global Monitoring Report 2005, Education for All: The Quality Imperative. Retrieved from http://portal.unesco.org/education/en/ev.php-URL_ID=35939&URL_DO=DO_TOPIC&URL_SECTION=201.html (30 August 2008).

Unt, I. (1990). *Individualizacija i differenciacija obuchenija* [Individualization and differentiation of training]. Moskva.

Ušeckienė, L. (2000). 5-7 metų vaikų žinių apie gamtą ypatumai [Some peculiarities of knowledge about nature of 5-7 years nursery school children]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje* (VI respublikinės mokslinės konferencijos straipsnių rinkinys) (pp. 189-196). Šiauliai.

Vaitkevičius, J. (1988). *Socialinės pedagogikos bruožai* [Social education features]. Vilnius: Mokslas.

Vaitkevičius, J. (1979). Žinių sisteminimas kaip pedagoginė problema [Systematization of knowledge as a pedagogical problem]. *Tarybinė mokykla*, *6*, 17.

Vaitkevičius, J. (1985). *Mokymo procesas* [Teaching process]. Kaunas, p. 55.

Vaitkevičius, J. (1995). *Socialinės pedagogikos pagrindai* [Social pedagogy basics]. Vilnius: Egalda.

Vaitkevičius, J. (1998). Gamtos ir žmogaus sąšauka Vydūno filosofijoje [Nature and human linkup in Vydūnas philosophy]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje* (IV respublikinės mokslinės praktinės konferencijos straipsnių rinkinys) (pp. 148-151). Vilnius.

Vaitkevičius, J. (2000). Gamta ir žmogus: kai kurie sąveikos aspektai gamtamokslinio ugdymo kontekste [Nature and man: Some aspects of interrelations in the context of natural science education]. Kn.: *Gamtamokslinis ugdymas bendrojo lavinimo mokykloje* (VI respublikinės mokslinės konferencijos straipsnių rinkinys) (pp. 74-79). Šiauliai.

Vaivode, E. T. (2010). *Ievads dabaszinibu macibu metodikas vesture (1774-1940)* [Introduction to natural sciences teaching methodology history]. Lielvarde.

Večkienė, N. (1991). Dėl chemijos mokymo diferencijavimo [Due to the chemistry teaching differentiation]. Kn.: *Mokymo ir auklėjimo klausimai*. Vilnius, T. 23.

Vertybių permainų metais [When values change] (1999). Vilnius, p. 3.

Vygotskij, L. (1934). *Myshlenie i rech'* [Thinking and speech]. Moskva, s. 119-147.

von Glasersfeld, E. (1995). Learning mathematics: Constructivist and interactionist theories of mathematical development, Review of the book *Learning Mathematics: Constructivist and Interactionist Theories of Mathematical Development*, P. Cobb (Ed.), in *Zentralblatt fur Didaktik der Mathematik*, *4*, 120-122.

Wang, H. (2004). Why teach science? Graduate science students' perceived motivations for choosing teaching as a career in Taiwan. *International Journal of Science Education*, *26* (1), 113-128.

Watters, James, J., Ginns, Ian, S. (2000). Developing motivation to teach elementary science: Effect of collaborative and authentic learning practices in preservice education. *Journal of Science Teacher Education*, *11* (4), 277-313.

Weinsten, R. S., et al. (1991). Expectations and high school change: Teacher – researcher collaboration to prevent school failure. *American Journal of Community Psychology*, *19*, 333-402.

Wellington, J. (1996). *Secondary science. Contemporary issues and practical approaches*. London and New York.

Wenham, M. (1995). *Understanding primary science. Ideas, concepts and explanations*. London.

Woolnough, B. E. (1999). School science-real science? Personal knowledge, authentic science and student research projects. In.: Bandiera, M., et al. (Eds.), *Research in science education in Europe* (pp. 245-251). Dordrecht: Kluwer Academic Publishers.

Xu, H. (2001). The theory and philosophy, anthropology basis of creative education. *Educational Research*, *1*, 10-14.

Zagvjazinskij, V. (1968). O differencirovannom podhode [About the differentiated approach]. *Narodnoe obrazovanie*, *10*, 85-87.

Zaharova, N. E. (2000). Vstupaja v XXI vek: problemy ekologizacii kul'tury [Entering the 21st century: Problems of culture ecologization]. In.: *Science and education on the threshold of the III-rd millennium* (Vol. 2, p. 15-17). Minsk.

Zakgejm, A. Ju. (1991). Gumanizacija i gumanitarizacija himii - chto jeto takoe? [Humanization and humanitarization of chemistry - what is it?]. *Himija v shkole*, *2*, 3-5.

Zaleskienė I. (1993). Papildomo ugdymo sistemos metmenys [Outline of the additional education system]. Kn.: *Lietuvos švietimo reformos gairės* (pp. 167-172). Vilnius.

Zeidmane A. (2000). Differentiation in the teaching and learning process. In.: A. Salitis et al. (Eds.) *Natural sciences and teacher training* (Collected articles of the international conference, Part 1) (pp. 132-136). Daugavpils.

Zoller U., Tsaparlis, G. (1997). HOCS-LOCS students: The case of chemistry. *Research in Science Education*, *27*, 117–130.

AFTERWORD

THE last page of the book is closed. A strange feeling comes, when different thematic works "lie down" into one book. Not everything I succeeded to describe, and what is described, not necessarily is as it is or it should be. But I hope, that those, who in one way or another will read that book, will find at least a mote of useful and interesting things in it. After all, it is not necessary to read it from A to Z. The content of the book is divided into several chapters, therefore, one can always choose only the most interesting topics.

It is understandable in itself, as it was mentioned in the introduction, I did not have an aim "to scoop out" education. Even after putting a period, such a feeling does not come, because it is not possible to do this at all. Education phenomenon is richer and more diverse than any other our work about it. Attempts to describe it, analyse, perceive and understand are always only partial. Let the book be only small fragments in a complex and diverse education world. The author will feel having achieved the aim, if this book provokes discussions, encourages to think wider and more differently, generates new ideas and insights. Psychologists say, that if you cannot change the situation or events, change the attitude to all this. When it seems, that we cannot orientate in the education labyrinths, it is necessary to change a thinking angle, to look differently. In other words, "to recharge" both outlook, and attitude, or beliefs. Maybe then a lot of things will change or start changing. I wish you this.

LAMANAUSKAS, Vincentas

Reflections on Education. Šiauliai: Scientia Socialis Ltd, 2017, pp. 244

ISBN 978-609-95513-3-3

The articles, earlier published in the international periodical press, covering the period 2007 to 2017 are presented by professor Vincentas Lamanauskas in the book "Reflections on education". Education science and practice actualities, problematics, insights are revealed and the author's position is expressed in these articles. The book is for all interested in education questions.

Designer Loreta Šimutytė-Balčiūnienė
Paste-up artist Linas Janonis
English language proofreader Ilona Ratkevičienė

Cover images are taken from Pixabay.com which are released free of copyrights under Creative Commons CC0.

04 June 2017. Publishing in Quires 5,75. Edition 200.

Publisher

Scientia Socialis Ltd.,
Donelaicio Street 29, LT-78115 Siauliai, Lithuania
E-mail: scientia@scientiasocialis.lt
Phone: +370 687 95668
Website: http://www.scientiasocialis.lt

Printing

Joint-stock company „Šiaulių spaustuvė"
9A P. Lukšio Street
LT-76207 Šiauliai, Lithuania
Phone: +370 41 500 333
Fax: +370 41 500 336
E-mail: info@dailu.lt